Cisco UCS C460 Server Installation and Service Guide

Covers Server Generation M1

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- Consult the dealer or an experienced radio/TV technician for help.

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Preface

This preface describes the audience, organization, and conventions of the *Cisco UCS C460 Server Installation and Service Guide*. It also provides information about how to obtain related documentation.

Related Documentation

The documentation set for the Cisco Unified Computing System (UCS) C-Series rack-mount servers is described in the road map document at the following link:

Cisco UCS C-Series Documentation Roadmap

Audience

This publication is for experienced network administrators who configure and maintain Cisco servers.

Organization

This guide is organized as follows:

Chapter	Title	Description
Chapter 1	Overview	Provides an overview of the Cisco UCS (Unified Computing System) C460 server.
Chapter 2	Installing the Server	Describes how to install the server in a rack, how to cable and power on the server, and how to initially set the server up.
Chapter 3	Maintaining the Server	Describes the server LEDs and buttons, identifies the replaceable components of the server, and describes how to replace them.
Appendix A	Server Specifications	Lists physical, environmental, and power specifications for the server.
Appendix B	Cable and Power Cord Specifications	Lists specifications for the supported international power cords.
Appendix C	RAID Controller Considerations	Provides server RAID controller information.

Conventions

This document uses the following conventions for notes, cautions, and safety warnings. Notes and cautions contain important information that you should know.

Note Means *reader take note*. Notes contain helpful suggestions or references to material that are not covered in the publication.

Caution Means *reader be careful*. Cautions contain information about something you might do that could result in equipment damage or loss of data.

Safety warnings appear throughout this guide in procedures that, if performed incorrectly, can cause physical injuries. A warning symbol precedes each warning statement.

Warning **IMPORTANT SAFETY INSTRUCTIONS**

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device. Statement 1071

SAVE THESE INSTRUCTIONS

Waarschuwing **BELANGRIJKE VEILIGHEIDSINSTRUCTIES**

Dit waarschuwingssymbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij elektrische schakelingen betrokken risico's en dient u op de hoogte te zijn van de standaard praktijken om ongelukken te voorkomen. Gebruik het nummer van de verklaring onderaan de waarschuwing als u een vertaling van de waarschuwing die bij het apparaat wordt geleverd, wilt raadplegen.

BEWAAR DEZE INSTRUCTIES

Varoitus **TÄRKEITÄ TURVALLISUUSOHJEITA**

Tämä varoitusmerkki merkitsee vaaraa. Tilanne voi aiheuttaa ruumiillisia vammoja. Ennen kuin käsittelet laitteistoa, huomioi sähköpiirien käsittelemiseen liittyvät riskit ja tutustu onnettomuuksien yleisiin ehkäisytapoihin. Turvallisuusvaroitusten käännökset löytyvät laitteen mukana toimitettujen käännettyjen turvallisuusvaroitusten joukosta varoitusten lopussa näkyvien lausuntonumeroiden avulla.

SÄILYTÄ NÄMÄ OHJEET

Attention   **IMPORTANTES INFORMATIONS DE SÉCURITÉ**

Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant entraîner des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers liés aux circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Pour prendre connaissance des traductions des avertissements figurant dans les consignes de sécurité traduites qui accompagnent cet appareil, référez-vous au numéro de l'instruction situé à la fin de chaque avertissement.

CONSERVEZ CES INFORMATIONS

Warnung   **WICHTIGE SICHERHEITSHINWEISE**

Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu Verletzungen führen kann. Machen Sie sich vor der Arbeit mit Geräten mit den Gefahren elektrischer Schaltungen und den üblichen Verfahren zur Vorbeugung vor Unfällen vertraut. Suchen Sie mit der am Ende jeder Warnung angegebenen Anweisungsnummer nach der jeweiligen Übersetzung in den übersetzten Sicherheitshinweisen, die zusammen mit diesem Gerät ausgeliefert wurden.

BEWAHREN SIE DIESE HINWEISE GUT AUF.

Avvertenza   **IMPORTANTI ISTRUZIONI SULLA SICUREZZA**

Questo simbolo di avvertenza indica un pericolo. La situazione potrebbe causare infortuni alle persone. Prima di intervenire su qualsiasi apparecchiatura, occorre essere al corrente dei pericoli relativi ai circuiti elettrici e conoscere le procedure standard per la prevenzione di incidenti. Utilizzare il numero di istruzione presente alla fine di ciascuna avvertenza per individuare le traduzioni delle avvertenze riportate in questo documento.

CONSERVARE QUESTE ISTRUZIONI

Advarsel   **VIKTIGE SIKKERHETSINSTRUKSJONER**

Dette advarselssymbolet betyr fare. Du er i en situasjon som kan føre til skade på person. Før du begynner å arbeide med noe av utstyret, må du være oppmerksom på farene forbundet med elektriske kretser, og kjenne til standardprosedyrer for å forhindre ulykker. Bruk nummeret i slutten av hver advarsel for å finne oversettelsen i de oversatte sikkerhetsadvarslene som fulgte med denne enheten.

TA VARE PÅ DISSE INSTRUKSJONENE

Aviso   **INSTRUÇÕES IMPORTANTES DE SEGURANÇA**

Este símbolo de aviso significa perigo. Você está em uma situação que poderá ser causadora de lesões corporais. Antes de iniciar a utilização de qualquer equipamento, tenha conhecimento dos perigos envolvidos no manuseio de circuitos elétricos e familiarize-se com as práticas habituais de prevenção de acidentes. Utilize o número da instrução fornecido ao final de cada aviso para localizar sua tradução nos avisos de segurança traduzidos que acompanham este dispositivo.

GUARDE ESTAS INSTRUÇÕES

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¡Advertencia! INSTRUCCIONES IMPORTANTES DE SEGURIDAD

Este símbolo de aviso indica peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considere los riesgos de la corriente eléctrica y familiarícese con los procedimientos estándar de prevención de accidentes. Al final de cada advertencia encontrará el número que le ayudará a encontrar el texto traducido en el apartado de traducciones que acompaña a este dispositivo.

GUARDE ESTAS INSTRUCCIONES

Varning! VIKTIGA SÄKERHETSANVISNINGAR

Denna varningssignal signalerar fara. Du befinner dig i en situation som kan leda till personskada. Innan du utför arbete på någon utrustning måste du vara medveten om farorna med elkretsar och känna till vanliga förfaranden för att förebygga olyckor. Använd det nummer som finns i slutet av varje varning för att hitta dess översättning i de översatta säkerhetsvarningar som medföljer denna anordning.

SPARA DESSA ANVISNINGAR

Opozorilo FONTOS BIZTONSÁGI ELOÍRÁSOK

Ez a figyelmezeto jel veszélyre utal. Sérülésveszélyt rejto helyzetben van. Mielott bármely berendezésen munkát végezte, legyen figyelemmel az elektromos áramkörök okozta kockázatokra, és ismerkedjen meg a szokásos balesetvédelmi eljárásokkal. A kiadványban szereplo figyelmeztetések fordítása a készülékhez mellékelt biztonsági figyelmeztetések között található; a fordítás az egyes figyelmeztetések végén látható szám alapján keresheto meg.

ORIZZE MEG EZEKET AZ UTASÍTÁSOKAT!

Предупреждение ВАЖНЫЕ ИНСТРУКЦИИ ПО СОБЛЮДЕНИЮ ТЕХНИКИ БЕЗОПАСНОСТИ

Этот символ предупреждения обозначает опасность. То есть имеет место ситуация, в которой следует опасаться телесных повреждений. Перед эксплуатацией оборудования выясните, каким опасностям может подвергаться пользователь при использовании электрических цепей, и ознакомьтесь с правилами техники безопасности для предотвращения возможных несчастных случаев. Воспользуйтесь номером заявления, приведенным в конце каждого предупреждения, чтобы найти его переведенный вариант в переводе предупреждений по безопасности, прилагаемом к данному устройству.

СОХРАНИТЕ ЭТИ ИНСТРУКЦИИ

警告 重要的安全性说明

此警告符号代表危险。您正处于可能受到严重伤害的工作环境中。在您使用设备开始工作之前，必须充分意识到触电的危险，并熟练掌握防止事故发生的标准工作程序。请根据每项警告结尾提供的声明号码来找到此设备的安全性警告说明的翻译文本。

请保存这些安全性说明

约标准工作程序。请 安全上の重要な注意事項

「危険」の意味です。人身事故を予防するための注意事項が記述されています。装置の取り扱い作業を行うときは、電気回路の危険性に注意し、一般的な事故防止策に留意してください。警告の各国語版は、各注意事項の番号を基に、装置に付属の「Translated Safety Warnings」を参照してください。

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이 지시 사항을 보관하십시오.

Aviso **INSTRUÇÕES IMPORTANTES DE SEGURANÇA**

Este símbolo de aviso significa perigo. Você se encontra em uma situação em que há risco de lesões corporais. Antes de trabalhar com qualquer equipamento, esteja ciente dos riscos que envolvem os circuitos elétricos e familiarize-se com as práticas padrão de prevenção de acidentes. Use o número da declaração fornecido ao final de cada aviso para localizar sua tradução nos avisos de segurança traduzidos que acompanham o dispositivo.

GUARDE ESTAS INSTRUÇÕES

Advarsel **VIGTIGE SIKKERHEDSANVISNINGER**

Dette advarselssymbol betyder fare. Du befinder dig i en situation med risiko for legemesbeskadigelse. Før du begynder arbejde på udstyr, skal du være opmærksom på de involverede risici, der er ved elektriske kredsløb, og du skal sætte dig ind i standardprocedurer til undgåelse af ulykker. Brug erklæringsnummeret efter hver advarsel for at finde oversættelsen i de oversatte advarsler, der fulgte med denne enhed.

GEM DISSE ANVISNINGER

تحذير **إرشادات الأمان الهامة**

يوضح رمز التحذير هذا وجود خطر. وهذا يعني أنك متواجد في مكان قد ينتج عنه التعرض لإصابات. قبل بدء العمل، احذر مخاطر التعرض للصدمات الكهربائية وكن على علم بالإجراءات القياسية للحيلولة دون وقوع أي حوادث. استخدم رقم البيان الموجود في أخر كل تحذير لتحديد مكان ترجمته داخل تحذيرات الأمان المترجمة التي تأتي مع الجهاز.

قم بحفظ هذه الإرشادات

Upozorenje　VAŽNE SIGURNOSNE NAPOMENE

Ovaj simbol upozorenja predstavlja opasnost. Nalazite se u situaciji koja može prouzročiti tjelesne ozljede. Prije rada s bilo kojim uređajem, morate razumjeti opasnosti vezane uz električne sklopove, te biti upoznati sa standardnim načinima izbjegavanja nesreća. U prevedenim sigurnosnim upozorenjima, priloženima uz uređaj, možete prema broju koji se nalazi uz pojedino upozorenje pronaći i njegov prijevod.

SAČUVAJTE OVE UPUTE

Upozornění　DŮLEŽITÉ BEZPEČNOSTNÍ POKYNY

Tento upozorňující symbol označuje nebezpečí. Jste v situaci, která by mohla způsobit nebezpečí úrazu. Před prací na jakémkoliv vybavení si uvědomte nebezpečí související s elektrickými obvody a seznamte se se standardními opatřeními pro předcházení úrazům. Podle čísla na konci každého upozornění vyhledejte jeho překlad v přeložených bezpečnostních upozorněních, která jsou přiložena k zařízení.

USCHOVEJTE TYTO POKYNY

Προειδοποίηση　ΣΗΜΑΝΤΙΚΕΣ ΟΔΗΓΙΕΣ ΑΣΦΑΛΕΙΑΣ

Αυτό το προειδοποιητικό σύμβολο σημαίνει κίνδυνο. Βρίσκεστε σε κατάσταση που μπορεί να προκαλέσει τραυματισμό. Πριν εργαστείτε σε οποιοδήποτε εξοπλισμό, να έχετε υπόψη σας τους κινδύνους που σχετίζονται με τα ηλεκτρικά κυκλώματα και να έχετε εξοικειωθεί με τις συνήθεις πρακτικές για την αποφυγή ατυχημάτων. Χρησιμοποιήστε τον αριθμό δήλωσης που παρέχεται στο τέλος κάθε προειδοποίησης, για να εντοπίσετε τη μετάφρασή της στις μεταφρασμένες προειδοποιήσεις ασφαλείας που συνοδεύουν τη συσκευή.

ΦΥΛΑΞΤΕ ΑΥΤΕΣ ΤΙΣ ΟΔΗΓΙΕΣ

אזהרה　　**הוראות בטיחות חשובות**

סימן אזהרה זה מסמל סכנה. אתה נמצא במצב העלול לגרום לפציעה. לפני שתעבוד עם ציוד כלשהו, עליך להיות מודע לסכנות הכרוכות במעגלים חשמליים ולהכיר את הנהלים המקובלים למניעת תאונות. השתמש במספר ההוראה המסופק בסופה של כל אזהרה כד לאתר את התרגום באזהרות הבטיחות המתורגמות שמצורפות להתקן.

שמור הוראות אלה

Opomena　　ВАЖНИ БЕЗБЕДНОСНИ НАПАТСТВИЈА
Симболот за предупредување значи опасност. Се наоѓате во ситуација што може да предизвика телесни повреди. Пред да работите со опремата, бидете свесни за ризикот што постои кај електричните кола и треба да ги познавате стандардните постапки за спречување на несреќни случаи. Искористете го бројот на изјавата што се наоѓа на крајот на секое предупредување за да го најдете неговиот период во преведените безбедносни предупредувања што се испорачани со уредот.
ЧУВАЈТЕ ГИ ОВИЕ НАПАТСТВИЈА

Ostrzeżenie   WAŻNE INSTRUKCJE DOTYCZĄCE BEZPIECZEŃSTWA

Ten symbol ostrzeżenia oznacza niebezpieczeństwo. Zachodzi sytuacja, która może powodować obrażenia ciała. Przed przystąpieniem do prac przy urządzeniach należy zapoznać się z zagrożeniami związanymi z układami elektrycznymi oraz ze standardowymi środkami zapobiegania wypadkom. Na końcu każdego ostrzeżenia podano numer, na podstawie którego można odszukać tłumaczenie tego ostrzeżenia w dołączonym do urządzenia dokumencie z tłumaczeniami ostrzeżeń.

NINIEJSZE INSTRUKCJE NALEŻY ZACHOWAĆ

Upozornenie   DÔLEŽITÉ BEZPEČNOSTNÉ POKYNY

Tento varovný symbol označuje nebezpečenstvo. Nachádzate sa v situácii s nebezpečenstvom úrazu. Pred prácou na akomkoľvek vybavení si uvedomte nebezpečenstvo súvisiace s elektrickými obvodmi a oboznámte sa so štandardnými opatreniami na predchádzanie úrazom. Podľa čísla na konci každého upozornenia vyhľadajte jeho preklad v preložených bezpečnostných upozorneniach, ktoré sú priložené k zariadeniu.

USCHOVAJTE SI TENTO NÁVOD

警告   重要安全性指示
此警告符號代表危險，表示可能造成人身傷害。使用任何設備前，請留心電路相關危險，並熟悉避免意外的標準作法。您可以使用每項警告後的聲明編號，查詢本裝置隨附之安全性警告譯文中的翻譯。
請妥善保留此指示

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html

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C H A P T E R **1**

Overview

This chapter provides an overview of the Cisco UCS C460 server features.

The Cisco UCS C460 server is a part of the Cisco UCS C-Series rack-mount server family. It is a high-performance, high-memory-capacity server designed with the performance and reliability to power compute-intensive, enterprise-critical standalone applications and virtualized workloads.It operates in a wide range of data center environments. These environments include the Cisco Unified Computing System, the Cisco Nexus switches, and discrete Ethernet and Fibre Channel switches from Cisco and third parties.

Figure 1-1 shows the front panel features.

Figure 1-1   Front Panel Features
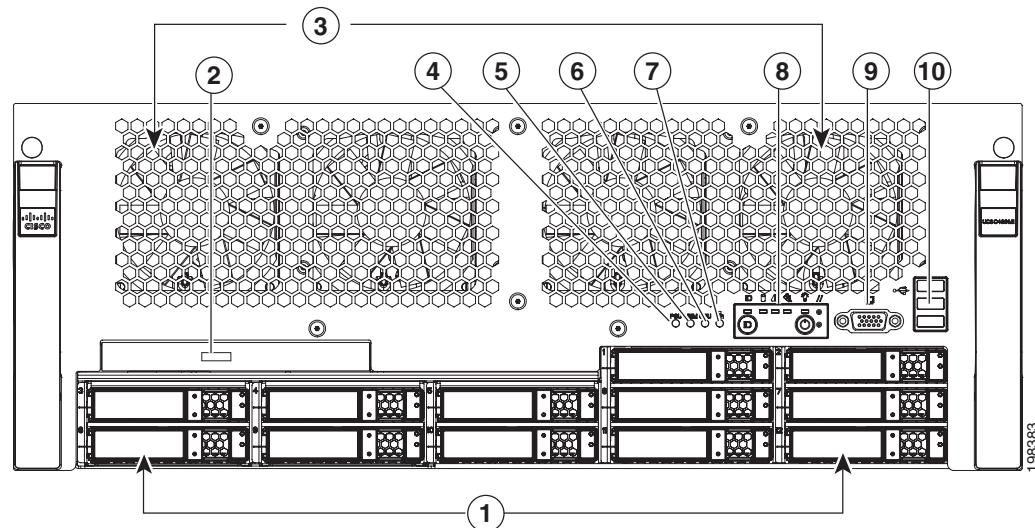
1	HDDs, up to twelve	**2**	SATA DVD-RW drive
3	Fans, up to eight	**4**	Power supply status LED
5	Memory status LED	**6**	CPU status LED
7	Network activity LED	**8**	Operations panel (see Figure 1-2 for a detailed view)
9	VGA connector	**10**	USB ports, three

Figure 1-2 shows the operations panel LEDs and buttons.

Figure 1-2   Operations Panel LEDs and Buttons
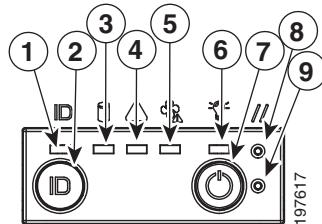
1	ID LED	2	ID button
3	HDD fault LED	4	System health LED
5	Fan fault LED	6	Power status LED
7	Power button	8	Reset button
9	NMI button		

Figure 1-3 shows the rear panel features.

Figure 1-3   Rear Panel Features
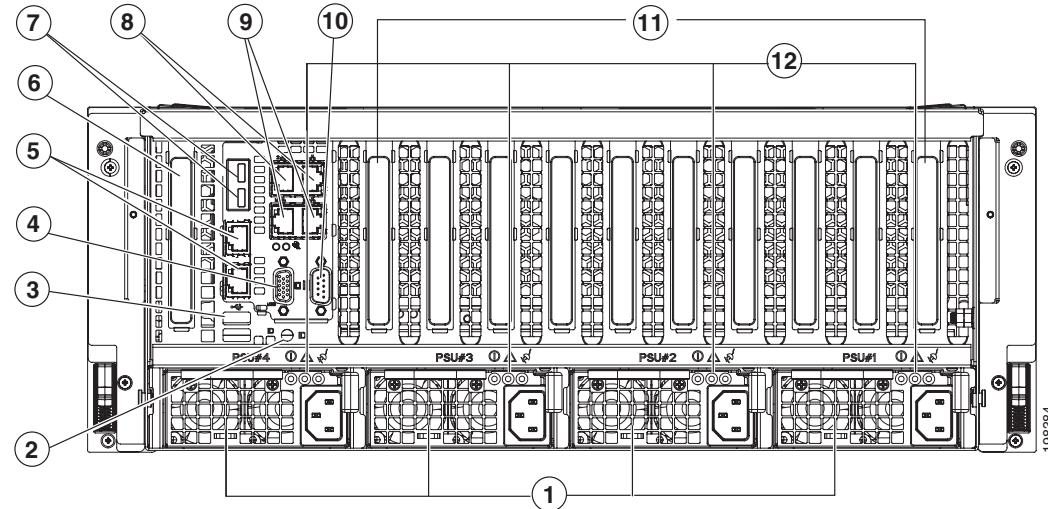
1	Power supplies, up to four	2	ID button
3	USB ports, two total	4	VGA connector
5	10GBase-T LOM ports, two total	6	SAS riser slot
7	10G SFP+ LOM ports, two total	8	1G LOM ports, two total
9	10/100 Management ports M1 and M2	10	Serial connector
11	PCIe slots 1 through 10 (left to right as shown)	12	Power supply LEDs

Table 1-1 lists the features of the C460 server.

.

Table 1-1   Cisco UCS C460 Server Features

Chassis	Four rack-unit (4RU) chassis
Processors	Either 2 or 4 Xeon 7500 Series processors. Two-CPU configurations require 2 power supplies and 4-CPU configurations require 4 power supplies.
Memory	Up to 64 DIMMs[1], populated in 8 slots on each of the 8 memory risers. Up to 512 GB of industry-standard DDR3[2] memory.
Storage	Up to twelve, 2.5" SAS[3] or SATA[4] hard drives or solid state drives. Up to 6 TB of hot-pluggable storage.
Disk Management	Factory-configured RAID[5] support options: • RAID 0, 1, 5, 6, 10, 50, and 60 support for up to 12 SAS or SATA drives, with the optional LSI MegaRAID SAS 9260-8i RAID controller There is a dedicated SAS riser slot for the RAID controller card in the chassis. There is also a mounting point inside the chassis for the optional RAID battery backup unit that is available when using the LSI MegaRAID SAS 9260-8i controller.
PCIe I/O	Ten PCIe[6] expansion slots, four hot-pluggable. • Slots 1 and 2—Gen 2x8, 3/4 length card, x24 hot-swappable connectors • Slots 3 and 4—Gen 2x4, 1/2 length card, x8 connectors • Slot 5—Gen 2x16, 3/4 length card, x16 connector • Slots 6 and 7—Gen 2x8, 3/4 length card, x8 hot-swappable connectors • Slot 8—Gen 1x4, 3/4 length card, x8 connector • Slot 9—Gen 1x4, 1/2 length card, x8 connector • Slot 10—Gen 2x4, 1/2 length card, x8 connector Where "Gen nxn" is the electrical lane width and "xn connector" is the mechanical length of the connector. The card length is the supported length because of internal clearance. All PCIe slots are standard-height and require a standard-height mounting bracket on the PCIe card. CPU3 must be installed to support PCIe slots 5, 6, 7, 9, and 10. Legacy I/O devices like video cards are only supported on slots 1,2,3, 4 and 8.

Table 1-1   Cisco UCS C460 Server Features (continued)

Network and management I/O	The server provides these rear-panel connectors:
	• Two dedicated 10/100 Ethernet management ports
	• Two 1Gb Ethernet ports
	• Two 10Gb Base-T Ethernet ports
	• Two 10Gb SFP+ Ethernet ports
	Note See Using the 10 Gb Ports, page 2-12 for more information about the SFP+ and 10GBase-T 10 Gb ports.
	• One DB9 serial connector.
	• One 15-pin VGA[7] connector.
	• Two USB[8] 2.0 connectors.
	The server provides these front-panel connectors:
	• One 15-pin VGA connector.
	• Three USB 2.0 connectors.
Power	Either 2 or 4 power supplies, 850W each. Hot-swappable, rear-accessible, and redundant as 2+2 or 3+1.
	Note You can use 2 power supplies with a 2-CPU configuration. In this case, 1+1 redundancy is supported only if your server's overall power consumption can be supported by a single 850W power supply during the failure and hot-swap. For more information about your server's power consumption, consult with your Cisco sales representative or use the power calculator accessible at the Unified Computing System Partner Resource Center: http://www.ciscoprc.com/resourcelib.asp?id=937
Cooling	Up to 8 fans, hot-swappable, redundant as 7+1, or non-redundant as 4. Also, there are 4 fans in each power supply for lower-section cooling.

1. DIMM = dual inline memory module
2. DDR = double data rate (transfer mode)
3. SAS = serial attached SCSI
4. SATA = serial advanced technology attachment
5. RAID = redundant array of independent disks
6. PCIe = peripheral component interconnect express
7. VGA = video graphics array
8. USB = universal serial bus

C H A P T E R 2

Installing the Server

This chapter describes how to install the server, and it includes the following sections:

Note Before you install, operate, or service a server, review the *Regulatory Compliance and Safety Information for Cisco UCS C-Series Servers* for important safety information.

Warning **IMPORTANT SAFETY INSTRUCTIONS**

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device. Statement 1071

SAVE THESE INSTRUCTIONS

Unpacking and Inspecting the Server

⚠ **Caution**   When handling server components, wear an ESD strap and handle modules by the carrier edges only.

🔍 **Tip**   Keep the shipping container in case the server requires shipping in the future.

✎ **Note**   The chassis is thoroughly inspected before shipment. If any damage occurred during transportation or any items are missing, contact your customer service representative immediately.

To inspect the shipment, follow these steps:

Step 1   Remove the server from its cardboard container and save all packaging material.

Step 2   Compare the shipment to the equipment list provided by your customer service representative and Figure 2-1. Verify that you have all items.

Step 3   Check for damage and report any discrepancies or damage to your customer service representative. Have the following information ready:

- Invoice number of shipper (see the packing slip)
- Model and serial number of the damaged unit
- Description of damage
- Effect of damage on the installation

Figure 2-1   Shipping Box Contents
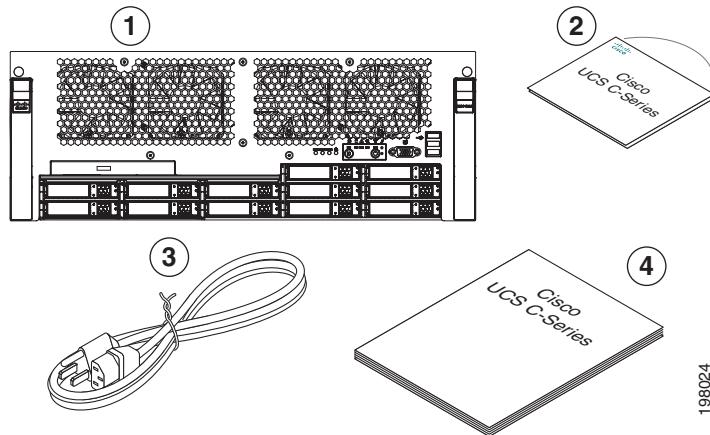
| **1** | Server | **2** | Drivers and utilities disk |
| **3** | Power cord (optional, up to four) | **4** | Documentation |

Preparing for Server Installation

This section provides information about preparing for server installation, and it includes the following topics:

Installation Guidelines

Warning   **To prevent the system from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature of: 35° C (95° F).**
Statement 1047

Warning   **The plug-socket combination must be accessible at all times, because it serves as the main disconnecting device.**
Statement 1019

Warning   **This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than: 250 V, 15 A.**
Statement 1005

Warning   **Installation of the equipment must comply with local and national electrical codes.**
Statement 1074

When you are installing a server, use the following guidelines:

- Plan your site configuration and prepare the site before installing the server. See the *Cisco UCS Site Preparation Guide* for the recommended site planning tasks.
- Ensure that there is adequate space around the server to allow for servicing the server and for adequate airflow. The airflow in this server is from front to back.
- Ensure that the air-conditioning meets the thermal requirements listed in the Server Specifications appendix.
- Ensure that the cabinet or rack meets the requirements listed in the "Rack Requirements" section on page 2-4.
- Ensure that the site power meets the power requirements listed in the Server Specifications appendix. If available, you can use an uninterruptible power supply (UPS) to protect against power failures.

Caution   Avoid UPS types that use ferroresonant technology. These UPS types can become unstable with systems such as the Cisco UCS, which can have substantial current draw fluctuations from fluctuating data traffic patterns.

Rack Requirements

This section provides the requirements for the standard open racks, assuming an external ambient air temperature range of 32°F to 95°F (0°C to 35°C).

The rack must be of the following type:

- A standard 19-in. (48.3-cm) wide, four-post EIA rack, with mounting posts that conform to English universal hole spacing, per section 1 of ANSI/EIA-310-D-1992.

- The rack post holes can be square or round when you use the supplied slide rails.

- The minimum vertical rack space per server must be four RUs, equal to 7 in. (17.8 cm).

Tip   The Cisco R-Series racks and RP-Series PDUs have been designed for optimum performance with Cisco products and are available from Cisco.

Equipment Requirements

The slide rails supplied by Cisco Systems do not require any tools for installation, but you might want to use a tape measure and level to help level the slide rails during installation.

Installing the Server In a Rack

The qualified and supported part numbers for this component are subject to change over time. For the most up-to-date list of replaceable components, see the following URL and navigate to the page for your server model and generation:

http://www.cisco.com/en/US/prod/ps10265/ps10493/c-series_part_numbers.html

This section describes how to install the server in a rack.

Warning   **To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:**
This unit should be mounted at the bottom of the rack if it is the only unit in the rack.
When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack. Statement 1006

Step 1   Install the slide rail assemblies in the rack. See Figure 2-2.

   a. Place the slide-rail assembly (item 3) against the inside of the front and rear rack posts (item 1), with the slide rail facing the inside of the rack and the front mounting pegs in front of the front rack-post holes (item 4).

   b. Expand the slide rail assembly toward the rear of the rack, until the rear mounting pegs seat in the rear rack-post holes (item 2).

   c. Compress the slide-rail assembly until the mounting pegs are fully seated and the locking clips at both ends of the assembly lock.

Figure 2-2   Installing the Slide Rail Assemblies in the Rack
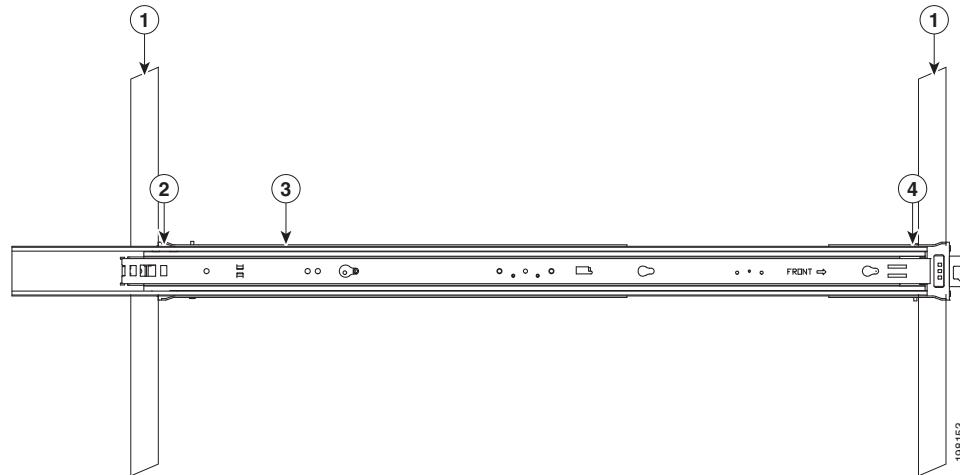
1	Rack posts	**2**	Rear mounting pegs and locking clip
3	Slide rail assembly	**4**	Front mounting pegs and locking clip

  d. Attach the second slide-rail assembly to the opposite side of the rack.

  e. Ensure that the two slide-rail assemblies are level and at the same height.

  f. Pull the inner slide rails on each assembly out toward the front of the rack until they hit the internal stops and lock in place.

Step 2   Attach mounting brackets to the server. See Figure 2-3:

  a. Place the mounting bracket (item 1) against the side of the server, with the end of the bracket marked *Front* toward the front of the server.

  b. Match the three bracket mounting holes with the three mounting pegs (item 3) on the side of the server.

  c. Slide the bracket toward the rear of the server until the metal tab on the bracket (item 2) locks over the rear mounting peg.

Figure 2-3   Attaching the Mounting Brackets to the Server
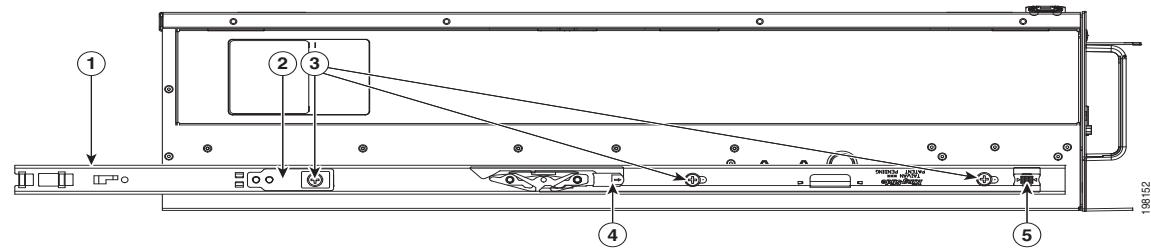
| **1**	Mounting bracket	**2**	Metal tab
3	Mounting pegs	**4**	Removal release clip
5	Installation release clip		

Step 3   Insert the server into the slide rails:

    a.   Align the rear of the mounting brackets with the front of the empty slide rails that you installed in Step 1.

    b.   Push the server into the slide rails until it stops at the internal stops.

    c.   Push the plastic installation release clip on each mounting bracket toward the server rear (see item 5 in Figure 2-3).

    d.   Continue pushing the server into the rack until its front flanges touch the rack posts and the thumb latches engage.

Step 4   (Optional) Attach the Cable Management Arm (CMA) to the rear of the slide rails. Directions in this step use the orientation of facing the rear of the rack and server. See Figure 2-4.

    a.   Attach the square metal connector with the blue tab (item 4) to the rear of the left slide rail assembly. Push in the clip until it locks in place.

    b.   Attach Connector B (item 5) to the metal connector that you attached to the left slide rail in step a.

    c.   Attach Connector A (item 2) to the rear end of the right slide rail. Snap the rectangular hole in the end of the connector over the rectangular peg at the end of the slide rail.

    d.   Attach the blue clip connector (item 3) to the right slide rail.

    e.   Attach the metal connector (item 1) to the rear of the mounting bracket that is attached to the right side of the server.

Figure 2-4   *Attaching the Cable Management Arm*
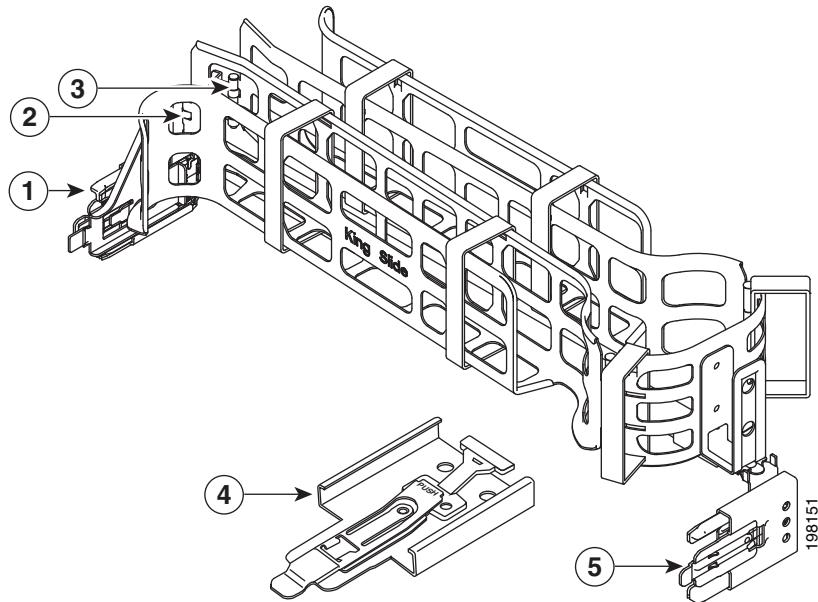
1	Metal connector	2	Connector A
3	Blue clip connector	4	Square metal connector with blue tab
5	Connector B		

Step 5   Continue with the Initial Server Setup, page 2-7.

Initial Server Setup

This section contains the following topics:

Connecting and Powering On the Server (Standalone Mode)

Note   The server is shipped with a default NIC mode called *Shared LOM*, default NIC redundancy is active-active, and DHCP is enabled. Shared LOM mode enables the two 1Gb Ethernet ports to access the Cisco Integrated Management Interface (CIMC). If you want to use the 10Gb Ethernet ports, the 10/100 management ports, or a Cisco network adapter card port to access the CIMC, you must first connect to the server and change the NIC mode as described in Step 3 of the following procedure. In that step, you can also change the NIC redundancy and set static IP settings.

Use the following procedure to perform initial setup of the server.

Step 1   Attach a supplied power cord to each power supply in your server, and then attach the power cord to a grounded AC power outlet. See the Power Specifications, page A-2 for power specifications.

Wait for approximately two minutes to let the server boot in standby power during the first bootup.

Note   Depending on how much memory is installed in the server, bootup might take two minutes or more because of the memory verification operation during bootup.

You can verify power status by looking at the Power Status LED (see Figure 1-1 on page 1-1):

- Off—The server is in standby power mode. Power is supplied only to the CIMC and some motherboard functions.
- Solid green—The server is in main power mode. Power is supplied to all server components.

Note   During bootup, the server beeps once for each USB device that is attached to the server. Even if there are no external USB devices attached, there is a short beep for each virtual USB device such as a virtual floppy drive, CD/DVD drive, keyboard, or mouse. A beep is also emitted if a USB device is hot-plugged or hot-unplugged during BIOS power-on self test (POST), or while you are accessing the BIOS Setup utility or the EFI shell.

Step 2   Connect a USB keyboard and VGA monitor to the USB and VGA connectors on the front panel (see Figure 1-1 on page 1-1).

Note   Alternatively, you can use the VGA and USB ports on the rear panel. However, you cannot use the front panel console connector VGA and the rear panel VGA at the same time. If you are connected to one VGA connector and you then connect a video device to the other connector, the first VGA connector is disabled. You can then reactivate the first VGA connector only by rebooting the server.

Step 3   Set NIC mode, NIC redundancy, and choose whether to enable DHCP or set static network settings:

a.   Press the **Power** button to boot the server. Watch for the prompt to press F8.

b.   During bootup, press **F8** when prompted to open the BIOS CIMC Configuration Utility.

```
CIMC Configuration Utility   Version 1.5  Cisco Systems, Inc.
*********************************************************************************
NIC Properties
NIC mode                                   NIC redundancy
Dedicated:        [_]                       None:            [ ]
Shared LOM:       [X]                       Active-standby:[X]
Shipping:         [ ]                       Active-active: [ ]
Shared LOM 10G:   [ ]
Cisco Card:       [ ]
IPV4 (Basic)                               Factory Defaults
DHCP enabled:     [ ]                       CIMC Factory Default:[ ]
CIMC IP:          172.29.237.70            Default User (Basic)
Subnetmask:       255.255.252.0             Default password:
Gateway:          172.29.236.1             Reenter password:
VLAN (Advanced)
VLAN enabled:     [ ]
VLAN ID:          1
Priority:         0

*********************************************************************************
<Up/Down arrow> Select items      <F10> Save     <Space bar> Enable/Disable
<F5> Refresh                      <ESC> Exit
```

c.   Set the NIC mode to your choice for which ports to use to access the CIMC for server management (see Figure 1-3 on page 1-2 for identification of the ports):

– Dedicated—The two 10/100 management ports are used to access the CIMC. You have to select a NIC redundancy and IP setting.

– Shared LOM (default)—The two 1Gb Ethernet ports are used to access the CIMC. This is the factory default setting, along with Active-active NIC redundancy and DHCP enabled.

– Shipping—The two 10/100 management ports are used to access the CIMC, but each port has a default setting:

Port M1—DHCP is enabled, with no NIC redundancy.

Port M2—Static IP address is 10.1.1.7, with no NIC redundancy.

– Shared LOM 10G—The two 10Gb Ethernet ports are used to access the CIMC. You have to select a NIC redundancy and IP setting.

Note   See Using the 10 Gb Ports, page 2-12 for more information about the SFP+ and 10G Base-T ports.

– Cisco Card—The ports on an installed Cisco network adapter card are used to access the CIMC. You have to select a NIC redundancy and IP setting.

> **Note** The Cisco Card NIC mode is currently supported only with a Cisco UCS P81E Virtual Interface Card (N2XX-ACPCI01) that is installed in PCIe slot 1 (see Figure 3-26 on page 3-34). See also Special Considerations for the Cisco UCS P81E Virtual Interface Card (N2XX-ACPCI01), page 3-37.

d. Use this utility to change the NIC redundancy to your preference. This server has three possible NIC redundancy settings:

- **None**—The Ethernet ports operate independently and do not fail over if there is a problem.
- **Active-standby**—If an active Ethernet port fails, traffic fails over to a standby port.
- **Active-active**—All Ethernet ports are utilized simultaneously.

e. Choose whether to enable DHCP for dynamic network settings, or enter static network settings.

> **Note** Before you enable DHCP, your DHCP server must be preconfigured with the range of MAC addresses for this server. The MAC address is printed on a label on the rear of the server. This server has a range of six MAC addresses assigned to the CIMC. The MAC address printed on the label is the beginning of the range of six contiguous MAC addresses.

f. Optional: Use this utility to make VLAN settings, and to set a default CIMC user password.

> **Note** Changes to the settings take effect after approximately 45 seconds. Refresh with **F5** and wait until the new settings appear before you reboot the server in the next step.

g. Press **F10** to save your settings and reboot the server.

> **Note** If you chose to enable DHCP, the dynamically assigned IP and MAC addresses are displayed on the console screen during bootup.

> **Tip** There is an alternate procedure for defining static settings by automating with a script. See the "Defining Static Network Settings Using a Script File" section on page 2-10.

Step 4 Connect to the CIMC for server management. Connect Ethernet cables from your LAN to the server by using the ports that you selected by your NIC Mode setting in Step 3. The Active-active and Active-passive NIC redundancy settings require you to connect to two ports.

Step 5 Use a browser and the IP address of the CIMC to connect to the CIMC Setup Utility. The IP address is based upon the settings that you made in Step 3 (either a static address or the address assigned by your DHCP server).

> **Note** The default user name for the server is *admin*. The default password is *password*.

Step 6 To manage the server, see the *Cisco UCS C-Series Rack-Mount Server Configuration Guide* or the *Cisco UCS C-Series Rack-Mount Server CLI Configuration Guide* for instructions on using those interfaces. The links to these documents are in the C-Series documentation roadmap:

http://www.cisco.com/go/unifiedcomputing/c-series-doc

Defining Static Network Settings Using a Script File

Use the following procedure to create a static network script:

Step 1   Use a text editor to create a file named **network.cfg**.

Step 2   Add the following content to **network.cfg**:

```
dhcp-enabled:
v4-addr:
v4-netmask:
v4-gateway:
vlan-enabled:
vlan-id:
vlan-priority:
password:
NIC-mode:
NIC-redundancy:
```

> **Note**   Use only the features that you want to set when adding content to **network.cfg**.

Example 2-1   network.cfg Example

```
dhcp-enabled: 0
v4-addr: 10.193.70.102
v4-netmask: 255.255.255.0
v4-gateway: 10.193.70.1
password: nonpasswd
```

Example 2-1 disables DHCP, sets the IP address, subnet mask, gateway, and user password.

Step 3   Use a text editor to create a file named **startup.nsh**. with the following contents:

```
fs0:
cimcconfig
```

Step 4   Copy your **network.cfg** file and your **startup.nsh** file to a USB thumb drive.

Step 5   Insert the USB thumb drive into a USB port on the server.

Step 6   Press and release the **Power** button to boot the server.

Step 7   Observe the booting process and press **F6** when prompted to enter the BIOS Boot Manager.

Step 8   Select EFI as the boot device and then press Enter.

The server power cycles and launches the configuration utility, which runs the **startup.nsh** file. Any errors are printed to the screen and an **errors.txt** file.

Step 9   Remove the USB thumb drive, alter the **network.cfg** file with your next IP address, and then insert the USB thumb drive into the next server that you want to configure.

Step 10   After the server has been assigned an IP address, you can use that address to access the service processor's GUI or CLI management system. See the *Cisco UCS C-Series Server Integrated Management Controller Configuration Guide* or the *Cisco UCS C-Series Server Integrated Management Controller CLI Configuration Guide*.

NIC Modes and NIC Redundancy Settings

This server has the following NIC mode settings that you can choose from:

- Dedicated—The two 10/100 management ports are used to access the CIMC. You have to select a NIC redundancy and IP setting.

- Shared LOM (default)—The two 1Gb Ethernet ports are used to access the CIMC. This is the factory default setting, along with Active-active NIC redundancy and DHCP enabled.

- Shipping—The two 10/100 management ports are used to access the CIMC, but each port has a default setting:

  - Port M1—DHCP is enabled, with no NIC redundancy.

  - Port M2—Static IP address is 10.1.1.7, with no NIC redundancy.

- Shared LOM 10G—The two 10Gb Ethernet ports are used to access the CIMC. You have to select a NIC redundancy and IP setting.

- Cisco Card—The ports on an installed Cisco network adapter card are used to access the CIMC. You have to select a NIC redundancy and IP setting.

Note   The Cisco Card NIC mode is currently supported only with a Cisco UCS P81E Virtual Interface Card (N2XX-ACPCI01) that is installed in PCIe slot 4 (see). See also .

This server has the following NIC redundancy settings that you can choose from:

- None—The Ethernet ports operate independently and do not fail over if there is a problem.

- Active-standby—If an active Ethernet port fails, traffic fails over to a standby port.

- Active-active—All Ethernet ports are utilized simultaneously.

Using the 10 Gb Ports

This server has four 10 Gb ports on the rear panel (see Figure 1-3 on page 1-2):

- Two 10GBase-T ports
- Two SFP+ ports

We recommend that you use either the two SFP+ ports or the two 10GBase-T ports.

Although there are four physical ports, only two can have active PHY links at one time. However, the dual media feature of this server does enable more advanced connections that can switch PHY links to alternate media when a PHY link goes down.

The underlying architecture has a dual media-access control (MAC) sub-layer that manages the PHY links for all four ports, as shown in Figure 2-5:

Figure 2-5   10 Gb Port Architecture
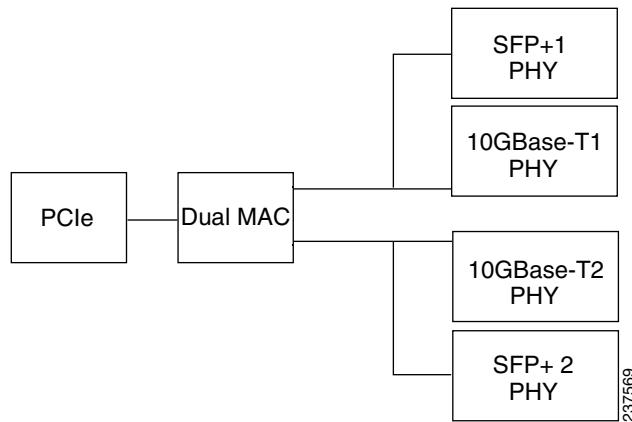
Note the following considerations:

- Your OS will report only the two PHY links that are active, rather than the four physical ports (for example, `10GE 1` and `10GE 2`). These could be the SFP+ ports or the 10GBase-T ports, depending on which have active links.

- You can connect to all four physical 10 Gb ports at once. However, only two of the ports will have active links at one time.

- If you connect to all four 10 Gb ports, the 10GBase-T PHY links have priority and they will be the active PHY links. If a 10GBase-T PHY link goes down or is disabled in this configuration, the dual MAC switches traffic to the corresponding SFP+ port.

- The driver firmware allows you to change the PHY link priority to the SFP+ ports, or to disable the PHY links for either the SFP+ or the 10GBase-T ports. Consult with your Cisco service provider for details of this advanced procedure.

Configuring BIOS Settings and Updating BIOS Firmware

This section contains information about the system BIOS and it includes the following sections:

Changing the Configuration of a BIOS Menu Item

You can change the BIOS settings for your server by using the procedure in this section. Detailed instructions are also printed on the BIOS screens.

Step 1   Enter the BIOS setup utility by pressing the **F2** key when prompted during bootup.

> **Note**   The version and build of the current BIOS are displayed on the Main page of the utility.

Step 2   Use the arrow keys to select the BIOS menu page.

Step 3   Highlight the field to be modified by using the arrow keys.

Step 4   Press **Enter** to select the field that you want to change, and then modify the value in the field.

Step 5   Press the right arrow key until the Exit menu screen is displayed.

Step 6   Follow the instructions on the Exit menu screen to save your changes and exit the setup utility (or Press **F10**). You can exit without saving changes by pressing **Esc**.

Overview of the BIOS Setup Utility

Table 2-1 contains a high-level description of the BIOS setup utility.

✎

Note Detailed descriptions of each field in the utility are printed on the individual BIOS screens.

Table 2-1 *Overview of the BIOS Setup Utility*

Screen	Contents
Main	Lists general information about BIOS version and system memory, settings to enable or disable and settings to define system date and time.
Advanced	Lists settings you can use to configure the following: • Processors and memory • Mass storage controllers • Serial port and USB ports • PCI • System acoustics and performance
Security	Lists settings you can use to do the following: Create and manage BIOS administrator and user passwords Enable front panel lockout, TPM state, and TPM administrative control
Server Management	Lists settings you can use to do the following: • Enable NMI (Non-Maskable Interrupt) • Enable Resume on AC Power Loss • Clear the system event log • Enable FRB-2 • Manage the OS Boot Watchdog Timer • Enable Plug and Play Detection • Set console redirection • View system information • Manage BMC LAN configuration
Boot Options	Lists settings you can use to do the following: • Define boot time-out options for F2 prompts • Define the boot order for CDROMs, floppy drives, hard drives, and network devices • Delete the boot option • Enable EFI Optimized Boot and Boot Option Retry
Boot Manager	Lists the devices that you can boot from.
Error Management	Lists system errors with descriptions and severity.
Exit	Lists options that you can use to exit the utility.

Updating the BIOS Firmware

You can update the BIOS firmware either by using the EFI interface during bootup, or by updating from a running Windows or Linux operating system (OS).

Determining the Current BIOS Version

There are two ways you can view the current version and build number of the BIOS:

- Press **F2** during server bootup to open the BIOS setup utility and look at the listing on the Main page.
- From within a running Windows or Linux OS, use the iFlash32 command with the **-i** option. See the iFlash32 Utility Command Options, page 2-18.

Updating the BIOS Firmware by Using the EFI Interface

Use the following procedure to update the BIOS firmware by using the EFI interface. Instructions are included for using local media or a virtual device.

Step 1 Download the BIOS update package for the server from Cisco.com and extract it to a temporary location.

To find the downloads for your server, see the following URL, then click **Unified Computing**, log in, and then click **Cisco UCS C-Series Rack-Mount Servers**.

http://www.cisco.com/cisco/web/download/index.html

Step 2 Prepare the BIOS update files on either local media for local upgrade, or as a virtual device for remote upgrade:

- **For local upgrade**—Perform these steps before you go to Step 3:

    a. Copy the contents of the extracted `bios/uefi/` folder to the root directory a USB thumb drive.

    b. Connect a VGA monitor and USB keyboard to the Cisco C-Series server.

    c. Insert the USB thumb drive into a USB port on the Cisco C-Series server.

- **For remote upgrade**—Perform these steps before you go to Step 3:

    a. Copy the contents of the extracted `bios/uefi/` folder to the root directory a USB thumb drive that is connected to your workstation.

    b. Use a browser to connect to the CIMC Manager software on the server that you are upgrading.

    Enter the CIMC IP address for that server in the address field of the browser, then enter your user name and password.

    c. Launch a KVM Console window (click the KVM keyboard icon).

    d. When the Virtual KVM Console window launches, select **Tools > Launch Virtual Media**.

    e. In the Virtual Media Session window, click **Add Image** and then use the dialog to navigate to the USB thumb drive that contains the contents of the `bios/uefi/` folder.

    The USB thumb drive is displayed in the Client View pane.

f. In the Virtual Media Session window, check the check box in the **Mapped** column for the USB thumb drive that you added, and then wait for mapping to complete. Observe the progress in the Details pane.

Step 3   Boot the server and press **F6** when prompted to get to the Boot Option screen.

Step 4   On the Boot Option screen, select **EFI Shell**.

Step 5   Wait for the on-screen message that says that the update is complete and the prompt to reboot the server. The update typically takes about three minutes.

Step 6   Reboot the server to complete the update.

Updating the BIOS Firmware from a Windows Operating System

Use the following procedure to update the BIOS firmware from a running Windows host OS.

> **Note**   The required version of the iFlash32 utility that is used in this procedure is iFlash32 Version 1.1, Build 3 or later. This utility is included in the BIOS firmware update package. See Determining the iFlash32 Utility Version and Build, page 2-18.

Step 1   Boot the server using a hard drive that has the Windows host OS installed.

Step 2   Download the BIOS update package for `Windows_x86` or `Windows_x64` and the server from Cisco.com and extract it to a temporary folder on the server's host OS.

To find the downloads for your server, see the following URL, then click **Unified Computing**, log in, and then click **Cisco UCS C-Series Rack-Mount Servers**.

http://www.cisco.com/cisco/web/download/index.html

> **Note**   Alternatively, if you do not have a browser installed on the server, you can download the package to a separate computer and then transfer the files by using a USB thumb drive. If you use this method, copy the contents of the extracted `Windows_x86` or `Windows_x64` folder to the root directory of the USB thumb drive, then insert the thumb drive into a USB port on the server.

Step 3   Install the BIOS update driver (`flashud.sys`) to the OS environment:

a. At a command prompt within your Windows OS, change directory to the location of the folder that you extracted in Step 2:

   – If you extracted to a location on the host OS, change directory to that folder.

   – If you are transferring the files with a USB thumb drive, change directory to that location using the drive letter assigned to the thumb drive.

b. Enter the following command to install the BIOS update driver to your OS environment:

   install.cmd

Step 4   At a command prompt within your OS, use the iFlash32 utility to update the system BIOS in non-interactive mode by entering the following command and options:

iflash32 /u [*BIOS file name*] **/ni**

See the iFlash32 Utility Command Options, page 2-18 for information about options.

Step 5   Reboot the server to complete the update.

Updating the BIOS Firmware from a Linux Operating System

Use the following procedure to update the BIOS firmware from a running host OS.

> **Note**   The required version of the iFlash32 utility that is used in this procedure is iFlash32 Version 1.1, Build 3 or later. This utility is included in the BIOS firmware update package. See Determining the iFlash32 Utility Version and Build, page 2-18.

Step 1   Boot the server using a hard drive that has the Linux host OS installed.

Step 2   Download the BIOS update package for Linux and the server from Cisco.com and extract it to a temporary folder on the server's host OS.

To find the downloads for your server, see the following URL, then click **Unified Computing**, log in, and then click **Cisco UCS C-Series Rack-Mount Servers**.

http://www.cisco.com/cisco/web/download/index.html

> **Note**   Alternatively, if you do not have a browser installed on the server, you can download the package to a separate computer and then transfer the files by using a USB thumb drive. If you use this method, copy the contents of the extracted `Linux` folder to the root directory of the USB thumb drive, then insert the thumb drive into a USB port on the server.

Step 3   Change directory to the folder that contains the BIOS update package.

- If you extracted to a location on the host OS, change directory to that folder, then continue with Step 4.
- If you are transferring the files with a USB thumb drive, perform the following steps:
    - **a.** At a Linux prompt, enter the following command to verify that the USB thumb drive is detected:

        fdisk -l

        If the thumb drive is detected, it appears as `/dev/sdb1` in the list of detected SCSI devices.
    - **b.** Mount the USB thumb drive as a directory in the Linux file system:

        mount /dev/sdb1 /mnt/usb
    - **c.** Change directory to the folder on the USB thumb drive that contains the BIOS update package. For example:

        cd /mnt/usb/c460

Step 4   Run the iFlash32 utility to update the system BIOS in non-interactive mode by entering the following command and options:

iflash32 - ./iflash32 -u -ni *[BIOS file name]***.cap**

See the iFlash32 Utility Command Options, page 2-18 for information about the available options.

Step 5   Reboot the server to complete the update.

iFlash32 Utility Command Options

You can use the iFlash32 command with the following options:

Note   The command syntax shown below is for Linux. For Windows, use "**/**" in place of "**-**" for all options.

- To view the command-line help page:

    iflash32 -h

- To update the system BIOS:

    iflash32 -u [*BIOS file name*]

- To update the system BIOS in non-interactive mode:

    iflash32 -u [*BIOS file name*] **-ni**

- To display BIOS file information:

    iflash32 -i [*BIOS file name*]

- To display the current system BIOS version:

    iflash32 -i

- To restore the BIOS settings to the factory defaults:

    iflash32 -rd

Determining the iFlash32 Utility Version and Build

Determine the version and build of the iFlash32 utility as follows:

Step 1   Copy the iFlash32.exe file to a USB thumb drive.

The iFlash32 utility is included with the BIOS firmware download. Find the file in the directory structure where you extracted the update package:

- For Windows: `...\c460-BOS\[BIOS version]\bios\windows\[Windows version]\`
- For Linux: `.../c460-BIOS/[BIOS version]/bios/linux/`

Step 2   Boot the server, and when prompted, press **F6** to open the Boot Option menu.

Step 3   Select **EFI Shell** to boot the server to the EFI shell.

Step 4   At the shell prompt, enter the **map -r** command to map the USB thumb drive.

Step 5   At the shell prompt, enter the **fs0:** to change the shell to the mapped USB thumb drive.

Step 6   Enter the command to display the iFlash32 information:

- For Windows: **iflash /i**
- For Linux: **iflash -i**

The output should be similar to the following:

```
Iflash32 BIOS Update Utility Ver 1.1 Build 3
Copyright (C) 2009-2010 Cisco Systems Inc.
```

Recovering a Corrupt BIOS

There are two ways that you can recover a corrupted BIOS:

- You can use the CIMC management interface, either GUI or CLI. For instructions, refer to the *Cisco UCS C-Series Rack-Mount Server Configuration Guide* or the *Cisco UCS C-Series Rack-Mount Server CLI Configuration Guide*.

- You can use the BIOS recovery function of header J6D1 on the motherboard. For instructions, refer to the "Using a BIOS Recovery Jumper on Header J6D1" section on page 2-19.

Using a BIOS Recovery Jumper on Header J6D1

The J6D1 header is a 3-pin header on the motherboard (see Figure 2-6 on page 2-20). You can use a jumper on this header to force the server to flash a new BIOS, in the case of a system hang. For example, if the system hangs after a BIOS update, use this procedure to force the server to look for the new firmware.

Step 1 Download the BIOS update package for the server from Cisco.com and extract it to a temporary location. Click Unified Computing at the following URL and navigate to the download.

http://www.cisco.com/cisco/web/download/index.html

Step 2 Copy the contents of the extracted UEFI folder to the root directory a USB thumb drive.

Step 3 Power off the server as described in the "Shutting Down and Powering Off the Server" section on page 3-6.

Step 4 Slide the server out the front of the rack far enough so that you can remove the top cover. You might have to detach cables from the rear panel to provide clearance.

⚠

Caution If you cannot safely view and access the component, remove the server from the rack.

Step 5 Remove the top cover as described in the "Removing and Replacing the Server Top Cover" section on page 3-7.

Step 6 Move the shorting jumper to pins 2 and 3 of the J6D1 header (see Figure 2-6 on page 2-20).

Step 7 Replace the top cover.

Step 8 Insert the USB thumb drive into a USB port on the server.

Step 9 Return the server to main power mode by pressing the **Power** button on the front panel. The server is in main power mode when the Power LED is green.

✎

Note You must allow the entire server to reboot to main power mode to complete the recovery. This is because the state of the jumper cannot be determined without the host CPU running. The server automatically boots into the UEFI shell and updates the BIOS from the USB thumb drive.

Step 10 Wait for server to complete the BIOS update, then remove the USB thumb drive from the server.

Step 11 Press the **Power** button to shut down the server to standby power mode.

Step 12 Remove the top cover from the server.

Step 13 Replace the shorting jumper to the default pins 1 and 2 of the J6D1 header.

> ✎
> **Note**   If you do not remove the jumper, the server forces a recovery of the new BIOS every time that you power cycle the server.

**Step 14**   Replace the top cover.

Step 15   Replace the server in the rack, replace cables, and then power on the server by pressing the **Power** button.

Motherboard Jumpers for Clearing BIOS Settings

You can use the following two jumpers to clear CMOS settings and to clear the BIOS administrator password.

- Using a Clear BIOS Admin Password Jumper on Header J5C3, page 2-21
- Using a Clear CMOS Jumper on Header J5C2, page 2-22

Figure 2-6   Service Jumper Locations
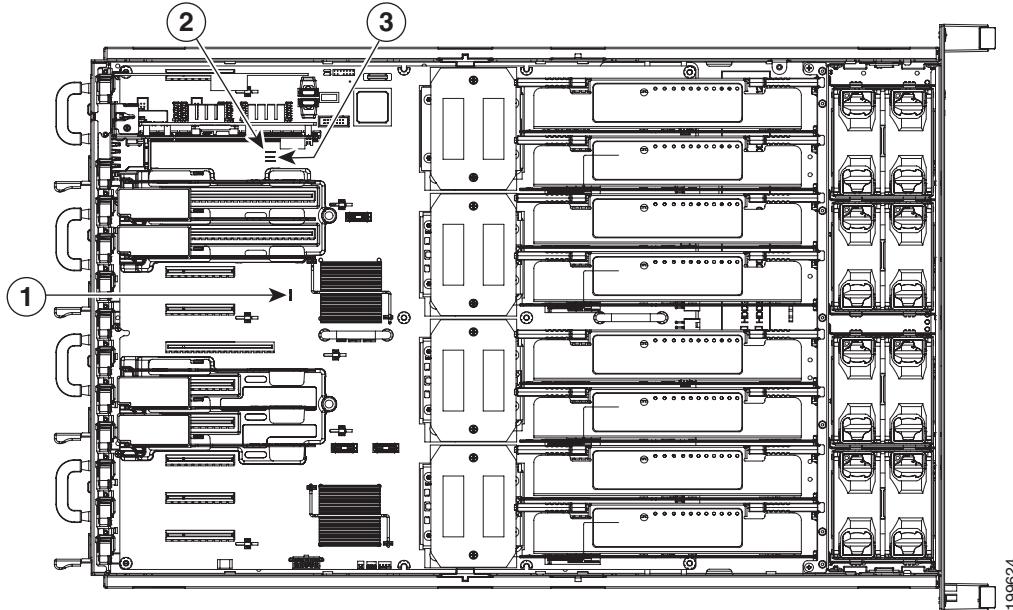
1	Jumper J6D1 (BIOS recovery)	**3**	Jumper J5C3 (clear BIOS password)
2	Jumper J5C2 (clear CMOS)		

Using a Clear BIOS Admin Password Jumper on Header J5C3

The J5C3 jumper is a 3-pin header on the motherboard (see Figure 2-6 on page 2-20). This procedure describes how to clear the Admin password for the BIOS back to the default in case the user-selected password is lost of forgotten.

Step 1 Power off the server as described in the "Shutting Down and Powering Off the Server" section on page 3-6.

Step 2 Slide the server out the front of the rack far enough so that you can remove the top cover. You might have to detach cables from the rear panel to provide clearance.

⚠️

Caution If you cannot safely view and access the component, remove the server from the rack.

Step 3 Remove the top cover as described in the "Removing and Replacing the Server Top Cover" section on page 3-7.

Step 4 Move the shorting jumper to pins 2 and 3 of the J5C3 header (see Figure 2-6 on page 2-20).

Step 5 Replace the top cover.

Step 6 Return the server to main power mode by pressing the **Power** button on the front panel. The server is in main power mode when the Power LED is green.

✎

Note You must allow the entire server to reboot to main power mode to complete the password reset. This is because the state of the jumper cannot be determined without the host CPU running. The password is then cleared.

Step 7 Press the **Power** button to shut down the server to standby power mode.

Step 8 Remove the top cover from the server.

Step 9 Replace the jumper to the default pins 1 and 2 on the J5C3 header.

✎

Note If you do not remove the jumper, the password is cleared every time you power-cycle the server.

Step 10 Replace the top cover.

Step 11 Replace the server in the rack, replace cables, and then power on the server by pressing the **Power** button.

Using a Clear CMOS Jumper on Header J5C2

The J5C3 jumper is a 3-pin header on the motherboard (see Figure 2-6 on page 2-20). You can use this procedure to clear the server's CMOS settings in the case of a system hang. For example, if the server hangs because of incorrect settings and does not boot, use this jumper to invalidate the settings and reboot with defaults.

Step 1   Power off the server as described in the "Shutting Down and Powering Off the Server" section on page 3-6.

Step 2   Slide the server out the front of the rack far enough so that you can remove the top cover. You might have to detach cables from the rear panel to provide clearance.

⚠

Caution   If you cannot safely view and access the component, remove the server from the rack.

Step 3   Remove the top cover as described in the "Removing and Replacing the Server Top Cover" section on page 3-7.

Step 4   Install a shorting jumper to pins 2 and 3 of the J5C2 header (see Figure 2-6 on page 2-20).

Step 5   Replace the top cover.

Step 6   Return the server to main power mode by pressing the **Power** button on the front panel. The server is in main power mode when the Power LED is green.

✎

Note   You must allow the entire server to reboot to main power mode to complete the reset. This is because the state of the jumper cannot be determined without the host CPU running.

Step 7   Press the **Power** button to shut down the server to standby power mode.

Step 8   Remove the top cover from the server.

Step 9   Replace the jumper to the default pins 1 and 2 on the J5C2 header.

✎

Note   If you do not remove the jumper, the CMOS settings are reset to the default every time you power-cycle the server.

Step 10   Replace the top cover.

Step 11   Replace the server in the rack, replace cables, and then power on the server by pressing the **Power** button.

Updating the CIMC Firmware

The server uses CIMC firmware obtained from and certified by Cisco. After you have downloaded a CIMC firmware image from Cisco, you can use it to update the firmware on your server. Cisco also provides release notes with each firmware image.

To find the downloads for your server, see the following URL, then click **Unified Computing**, log in, and then click **Cisco UCS C-Series Rack-Mount Servers**.

http://www.cisco.com/cisco/web/download/index.html

For instructions on updating the CIMC firmware, refer to the *Cisco UCS C-Series Rack-Mount Server Configuration Guide* or the *Cisco UCS C-Series Rack-Mount Server CLI Configuration Guide*. See the documentation road map at the following URL:

http://www.cisco.com/go/unifiedcomputing/c-series-doc

RAID Configurations on Hard Drives

For information about the RAID options in this server and how to access third-party RAID utilities, see RAID Controller Considerations, page C-1.

Note   If your server uses an LSI MegaRAID card for mass storage control, you might hear beeps coming from the card when you make changes to the array. See the "Replacing the Motherboard CMOS Battery" section on page 3-18 for more information.

C H A P T E R 3

Maintaining the Server

This chapter describes how to diagnose server system problems using LEDs. It also provides information about how to install or replace hardware components, and it includes the following sections:

- Status LEDs and Buttons, page 3-1
- Preparing for Server Component Installation, page 3-6
- Installing or Replacing Server Components, page 3-9

Status LEDs and Buttons

This section describes the location and meaning of LEDs and buttons, and it includes the following topics:

- Front Panel LEDs, page 3-2
- Operations Panel LEDs and Buttons, page 3-3\
- Rear Panel LEDs and Buttons, page 3-5

Front Panel LEDs

shows the front panel LEDs.

Figure 3-1   Front Panel LEDs ;
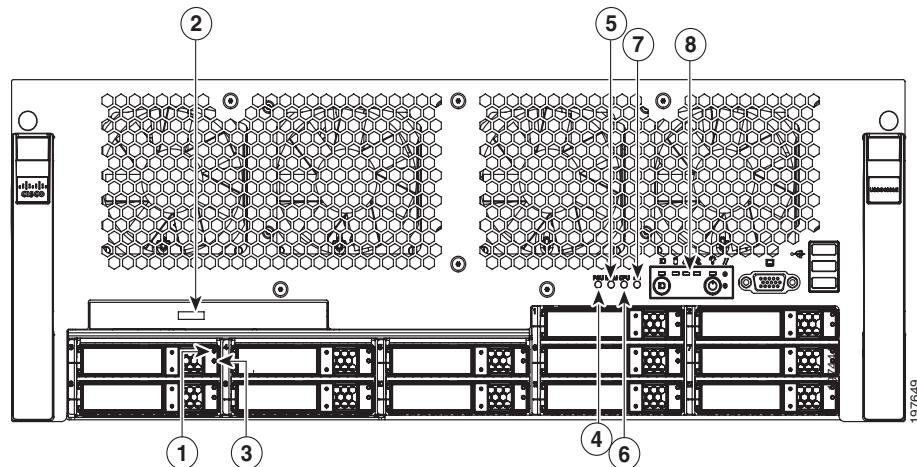
1	Hard drive activity LED	**2**	DVD drive activity LED
3	Hard drive fault LED	**4**	Power supply fault LED
5	Memory fault LED	**6**	CPU fault LED
7	Network activity LED	**8**	Operations panel (see Operations Panel LEDs and Buttons, page 3-3).

Table 3-1   Front Panel LEDs

LED Name	State
Hard drive activity	• Off—There is no hard drive in the hard drive sled (no access, no fault). • Green—The hard drive is ready. • Green, blinking—The hard drive is reading or writing data. There are activity LED differences between SATA and SAS hard drives. For SATA drives, the LED stays off during the reading or writing activity. • Amber and steady—The hard drive is in fault. The LED will also turn amber and steady when the locate hard drive function is used. • Amber and blinking—The hard drive is in predictive failure.
DVD drive activity	• Green and steady—The drive is not accessing data. • Green and blinking—The drive is accessing data.
Hard drive fault	• Off—The hard drive is operating properly. • Amber—This hard drive has failed. • Amber, blinking—The device is rebuilding.

Table 3-1   Front Panel LEDs (continued)

LED Name	State
Power supply fault	• Green—All power supplies are operating properly. • Off—One or more power supplies are not operating properly.
Memory fault	• Green—All DIMMs are operating properly. • Off—One or more DIMMs are not operating properly.
CPU fault	• Green—All CPUs are operating properly. • Off—One or more CPUs are not operating properly.
Network activity	• Off—The Ethernet link is idle. • Green and blinking —The Ethernet link is active. • Green and steady—The Ethernet link is detected but not active. The blink rate gets faster as network activity increases.
Operations panel LEDs	See Operations Panel LEDs and Buttons, page 3-3.

Operations Panel LEDs and Buttons

Figure 3-2 shows the operations panel LEDs and buttons.

Figure 3-2   Operations Panel LEDs and Buttons
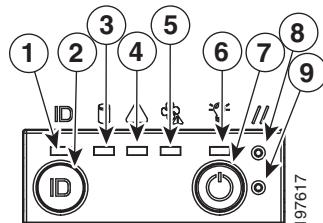
1	ID LED	**2**	ID button
3	Hard drive fault LED	**4**	System health LED
5	Fan fault LED	**6**	Power status LED
7	Power button	**8**	Reset button
9	NMI button		

Table 3-2   Operations Panel LEDs

LED Name	State
ID	• Off—The ID LED is not in use. • Blue and blinking—System ID is active via the remote ID button. • Blue and steady—System ID is active via the local ID button.
Hard drive fault	• Green—No hard drives have a fault. • Amber—At least one hard drive has failed.
System health	• Green—The system is not in fault. • Amber and steady—The system is in moderate fault. • Amber and blinking—The system is in severe fault.
Fan fault	• Off—All fan modules are operating properly. • Amber—At least one fan module has a moderate fault. • Amber, blinking—At least one fan module has a severe fault.
Power status	• Off—The server is in standby power mode or no power is present. • Green—The server is in main power mode.

Rear Panel LEDs and Buttons

Figure 3-3 shows the rear panel LEDs and buttons.

Figure 3-3   Rear Panel LEDs and Buttons
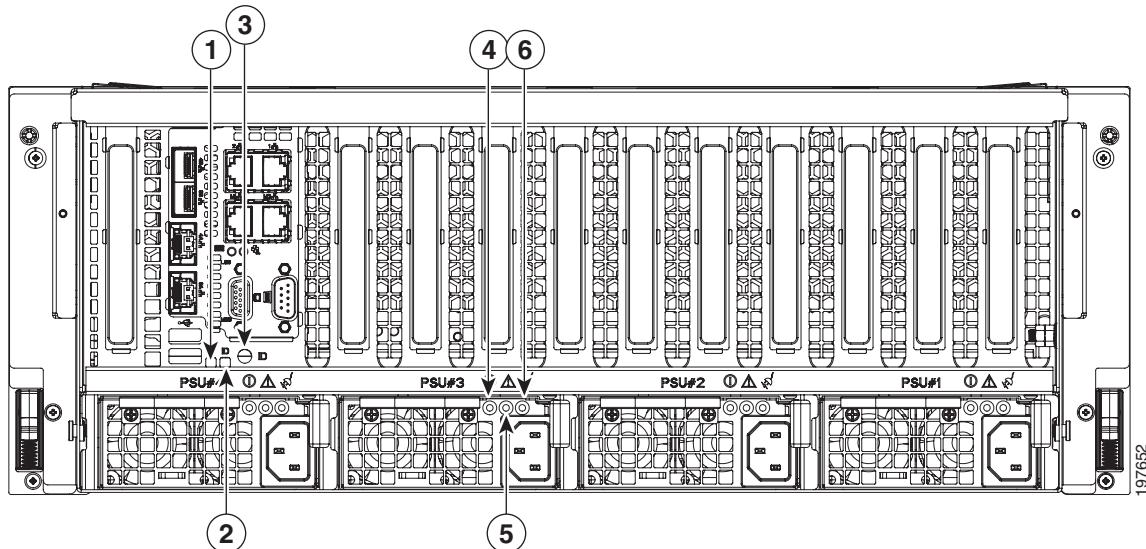
1	System health LED	2	ID LED
3	ID button	4	Power supply status LED
5	Power supply fault LED	6	Power supply AC input LED

Table 3-3   Operations Panel LEDs

LED Name	State
System health	• Green—The system is not in fault. • Amber and steady—The system is in moderate fault. • Amber and blinking—The system is in severe fault.
ID	• Off—The ID LED is not in use. • Blue and blinking—System ID is active via the remote ID button. • Blue and steady—System ID is active via the local ID button.
Power supply status LED	• Green and steady—The server is in main power mode. • Green and blinking—The power supply is off and it is in cold redundancy mode.
Power supply fault LED	• Off—The power supply is operating properly. • Amber and blinking—The power supply is warning of an event, but continues to operate. • Amber and steady—The power supply is in critical fault, causing a shut down.
Power supply AC input LED	• Green and steady—The AC power cord is plugged in and the power is present. • Green and blinking—The AC power cord is not plugged in.

Preparing for Server Component Installation

This section describes how to prepare for component installation, and it includes the following topics:

Required Equipment

The following equipment is used to perform the procedures in this chapter:

- Number 2 Phillips-head screwdriver
- Number 1 Phillips-head screwdriver
- Needle-nose pliers
- Electrostatic discharge (ESD) strap or other grounding equipment such as a grounded mat

Shutting Down and Powering Off the Server

The server can run in two power modes:

- Main power mode—Power is supplied to all server components and any operating system on your hard drives can run.
- Standby power mode—Power is supplied only to the service processor and the cooling fans and it is safe to power off the server from this mode.

You can invoke a graceful shutdown or an emergency shutdown (hard shutdown) by using either of the following methods:

- Use the CIMC management interface.
- Use the **Power** button on the server front panel. To use the **Power** button, follow these steps:

Step 1   Check the color of the Power Status LED (see the "Operations Panel LEDs and Buttons" section on page 3-3).

- Green indicates that the server is in main power mode and must be shut down before it can be safely powered off. Go to Step 2.
- Off indicates that the server is already powered off or is in in standby mode and can be safely powered off. Go to Step 3.

Step 2   Invoke either a graceful shutdown or a hard shutdown:

⚠

Caution   To avoid data loss or damage to your operating system, you should always invoke a graceful shutdown of the operating system.

- Graceful shutdown—Press and release the **Power** button. The operating system will perform a graceful shutdown and the server goes to standby mode, which is indicated by the Power Status LED being off.

- Emergency shutdown—Press and hold the **Power** button for 4 seconds to force the main power off and immediately enter standby mode.

Step 3 Disconnect the power cords from the power supplies in your server to completely power off the server.

Removing and Replacing the Server Top Cover

Use the following procedure to remove or replace the top cover of the server:

Tip You do not have to remove the cover to replace hard drives or power supplies.

Step 1 Remove the top cover:

a. Simultaneously press the two green release buttons. See Figure 3-4.

b. Push the cover toward the server rear about three inches, until it stops.

c. Lift the cover straight up from the server and set it aside.

Step 2 Replace the top cover:

a. Place the cover on top of the server about 3 inches behind the front of the chassis. The cover should sit flat when the cover flanges are sitting in the grooves in the chassis.

b. Slide the cover toward the front of the server until it stops at the front panel and the green buttons lock.

Figure 3-4   *Removing the Top Cover*
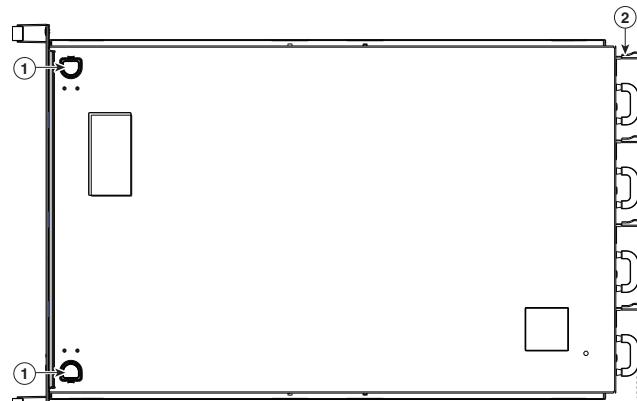
1	Green release buttons	2	Rear of the server

Replaceable Component Locations

This section shows the locations of the components that are discussed in this chapter. The view in Figure 3-5 is from the top down, with the top cover and internal CPU cage removed.

Figure 3-5   Replaceable Component Locations
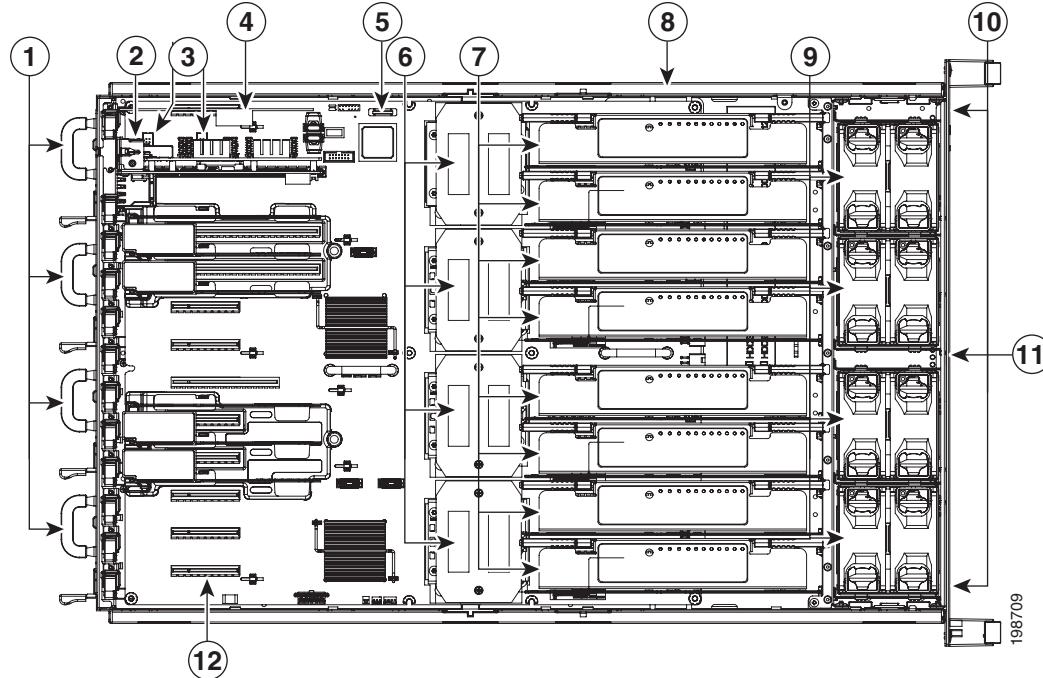
1	Power supplies, up to 4 (accessed through the rear panel).	2	I/O riser module.
3	eUSB connectors (2 on motherboard).	4	SAS riser (a dedicated slot for the optional RAID controller card)
5	CMOS battery	6	CPUs and heat sinks (up to 4, shown without CPU cage)
7	Memory risers, which provide slots for up to 8 DIMMs on each riser.	8	RAID battery backup unit (optional when using the LSI 9260 controller)
9	Fan modules (up to 8)	10	Hard drives (up to 12, accessed through the front panel)
11	DVD drive (accessed through the front panel)	12	PCIe connector 10 (10 of 10). See also Figure 3-26 on page 3-34 for all slots.

Send document comments to ucs-docfeedback@cisco.com

Installing or Replacing Server Components

⚠️

Warning   **Blank faceplates and cover panels serve three important functions: they prevent exposure to hazardous voltages and currents inside the chassis; they contain electromagnetic interference (EMI) that might disrupt other equipment; and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place.**
Statement 1029

⚠️

Warning   **Class 1 laser product.**
Statement 1008

⚠️

Caution   When handling server components, wear an ESD strap to avoid damage.

🔍

Tip   You can press the ID button on the front panel or rear panel to turn on a flashing ID LED on the front and rear panels of the server. This allows you to locate the specific server that you are servicing when you go to the opposite side of the rack. See the "Status LEDs and Buttons" section on page 3-1 for locations of the LEDs.

This section describes how to install and replace server components, and it includes the following topics:

- Replacing Power Supplies, page 3-10
- Replacing the I/O Riser, page 3-11
- Replacing an eUSB Drive, page 3-12
- Replacing a SAS Riser, page 3-14
- Replacing the SAS Riser Battery Backup Unit, page 3-16
- Replacing the Motherboard CMOS Battery, page 3-18
- Replacing CPUs and Heatsinks, page 3-20
- Replacing Memory Risers, page 3-23
- Replacing DIMMs, page 3-25
- Replacing Fan Modules, page 3-29
- Replacing Hard Drives or Solid State Drives, page 3-30
- Replacing a DVD Drive, page 3-32
- Replacing a PCIe Card, page 3-34

Replacing Power Supplies

The server can have two or four power supplies. Four power supplies are required for four-CPU configurations.

To replace or install a power supply, follow these steps:

Note   If you have ordered a server with power supply redundancy (at least four power supplies), you do not have to power off the server to replace power supplies. Also see the note below about 1+1 redundancy.

Step 1   Remove the power supply that you are replacing or a blank panel from an empty bay. See Figure 3-6:

   a. Do one of the following actions:

   – If your server has only two power supplies, shut down and power off the server as described in the "Shutting Down and Powering Off the Server" section on page 3-6. See the following note.

Note   You can use 2 power supplies with a 2-CPU configuration. In this case, 1+1 redundancy is supported only if your server's overall power consumption can be supported by a single 850W power supply during the failure and hot-swap. For more information about your server's power consumption, consult with your Cisco sales representative or use the power calculator accessible at the Unified Computing System Partner Resource Center:

   http://www.ciscoprc.com/resourcelib.asp?id=937

   – If your server has four power supplies, you do not have to shut down the server.

   b. Remove the power cord from the power supply that you are replacing.

   a. Grasp the power supply handle while squeezing the release lever towards the handle.

   b. Pull the power supply out of the slot.

Step 2   Install a new power supply:

   a. Grasp the power supply handle and insert the power supply into the power supply bay.

   b. Push the power supply into the bay until the release lever locks.

   c. Replace the power cord to the new power supply.

   d. Press the **Power** button to return the server to main power mode.

Figure 3-6   *Removing and Replacing Power Supplies*
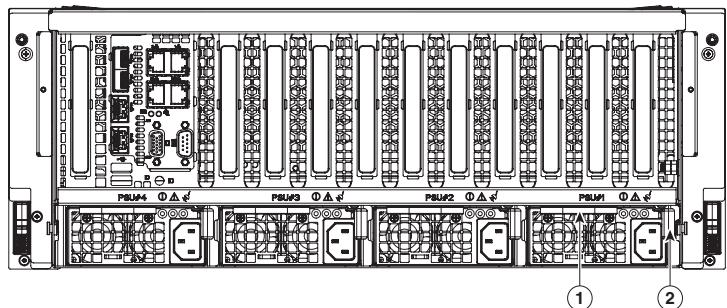
1	Power supply handle	2	Power supply release lever

Replacing the I/O Riser

The I/O riser is module that connects to the motherboard and that provides the ports for rear panel connectivity. To install or replace the I/O riser, follow these steps:

Step 1   Remove the I/O riser you are replacing. See Figure 3-7:

  a. Power off the server as described in the "Shutting Down and Powering Off the Server" section on page 3-6.

  b. Disconnect all cables from the ports on the I/O riser.

> **Tip**   Label the cables when you remove them to aid in identifying them for replacement.

  c. Slide the server out the front of the rack far enough so that you can remove the top cover.

> **Caution**   If you cannot safely view and access the component, remove the server from the rack.

  d. Remove the top cover as described in "Removing and Replacing the Server Top Cover" section on page 3-7.

  e. Pinch and lift up the green retaining clip that secures the I/O riser to the chassis rear panel.

  f. Lift the riser straight up from the motherboard connector and out of the chassis.

Step 2   Install a new I/O riser:

  a. Align the I/O riser with the empty I/O riser connector on the motherboard.

  b. Push down evenly on both ends of the I/O riser until it is fully seated in the motherboard connector.

  c. Ensure that the I/O riser rear panel sits flat against the chassis back panel opening.

  d. Push the green retaining clip down until it locks over the top of the I/O riser.

  e. Replace the top cover.

  f. Replace the server in the rack, replace cables, and then power on the server by pressing the **Power** button.

Figure 3-7   Removing and Replacing the I/O Riser
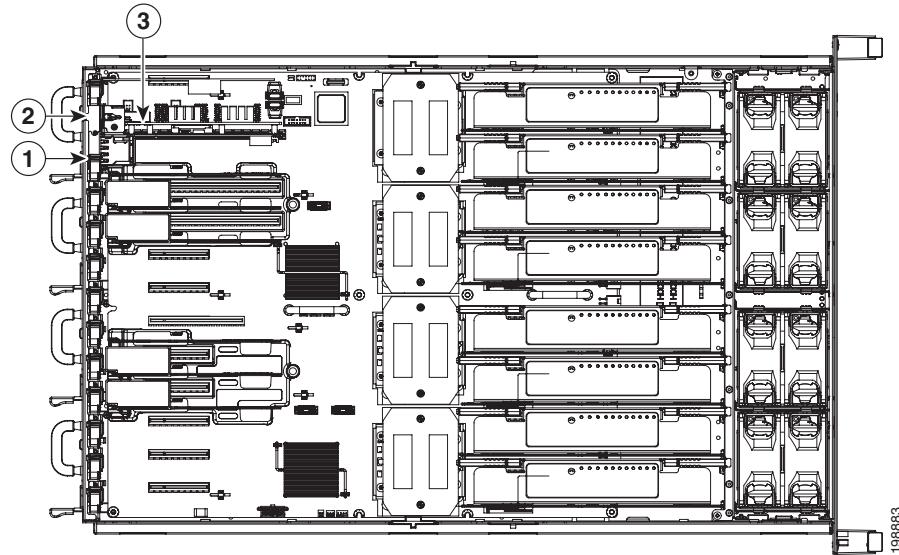
1	Retaining clip	**2**	I/O riser back panel
3	I/O riser		

Replacing an eUSB Drive

The eUSB drive is a small solid-state flash drive card that connects to the motherboard in either of two eUSB drive connectors. To install or replace the eUSB drive, follow these steps:

Step 1 Remove the eUSB drive you are replacing. See Figure 3-8:

a. Power off the server as described in the "Shutting Down and Powering Off the Server" section on page 3-6.

b. Slide the server out the front of the rack far enough so that you can remove the top cover.

Note You might have to detach cables from the rear panel to provide clearance.

Caution If you cannot safely view and access the component, remove the server from the rack.

c. Remove the top cover as described in "Removing and Replacing the Server Top Cover" section on page 3-7.

d. Remove the I/O riser to provide clearance. See Replacing the I/O Riser, page 3-11.

e. Locate the eUSB drive and remove the single screw that secures it to the motherboard standoff.

f. Lift straight up on both ends the eUSB drive to disengage it from the motherboard connector.

Step 2   Install a new eUSB drive.

    a. Align the connector on the underside of the eUSB drive with the empty drive connector on the motherboard and push on both ends of the drive evenly to seat the connector.

    b. Replace the single mounting screw that secures the eUSB drive to the motherboard standoff.

    c. Replace the I/O riser. See Replacing the I/O Riser, page 3-11.

    d. Replace the top cover.

    e. Replace the server in the rack, replace cables, and then power on the server by pressing the **Power** button.

Figure 3-8   Removing and Replacing the eUSB Drive
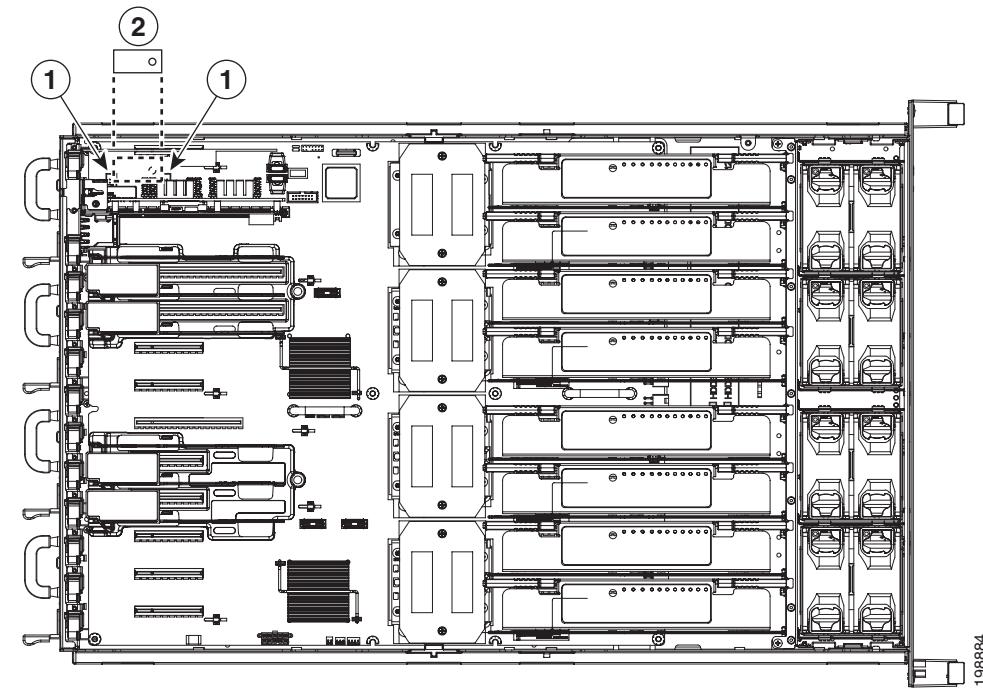
1	eUSB connectors on motherboard (two)	**2**	eUSB drive, showing orientation of hole for securing screw

Replacing a SAS Riser

The SAS riser is a RAID controller card that has a designated position and motherboard connector inside the server. To install or replace a SAS riser, follow these steps:

Step 1 Remove the SAS riser you are replacing. See Figure 3-9:

  a. Power off the server as described in the "Shutting Down and Powering Off the Server" section on page 3-6.

  b. Slide the server out the front of the rack far enough so that you can remove the top cover.

Note You might have to detach cables from the rear panel to provide clearance.

Caution If you cannot safely view and access the component, remove the server from the rack.

  c. Remove the top cover as described in "Removing and Replacing the Server Top Cover" section on page 3-7.

  d. Pinch and lift up the green retaining clip that secures the SAS riser to the chassis rear panel.

  e. Lift the SAS riser straight up from the motherboard connector.

Note Lift up on both ends of the card evenly to avoid damaging its connector.

  f. Disconnect the SAS cables and any battery backup unit (BBU) cable from the SAS riser. See Figure 3-10.

Tip Label the SAS cables when you disconnect them to aid correct connection to the new SAS riser.

Step 2 Install a new SAS riser:

  a. Connect the SAS cables and BBU cable to the new SAS riser. See Figure 3-10.

  b. Align the SAS riser with the empty SAS riser connector on the motherboard.

  c. Push down evenly on both ends of the SAS riser until it is fully seated in the motherboard connector.

  d. Ensure that the SAS riser rear panel sits flat against the server back panel opening.

  e. Push the green retaining clip down until it locks over the top of the SAS riser.

  f. Replace the top cover.

  g. Replace the server in the rack, replace cables, and then power on the server by pressing the **Power** button.

Figure 3-9   Removing and Replacing a SAS Riser
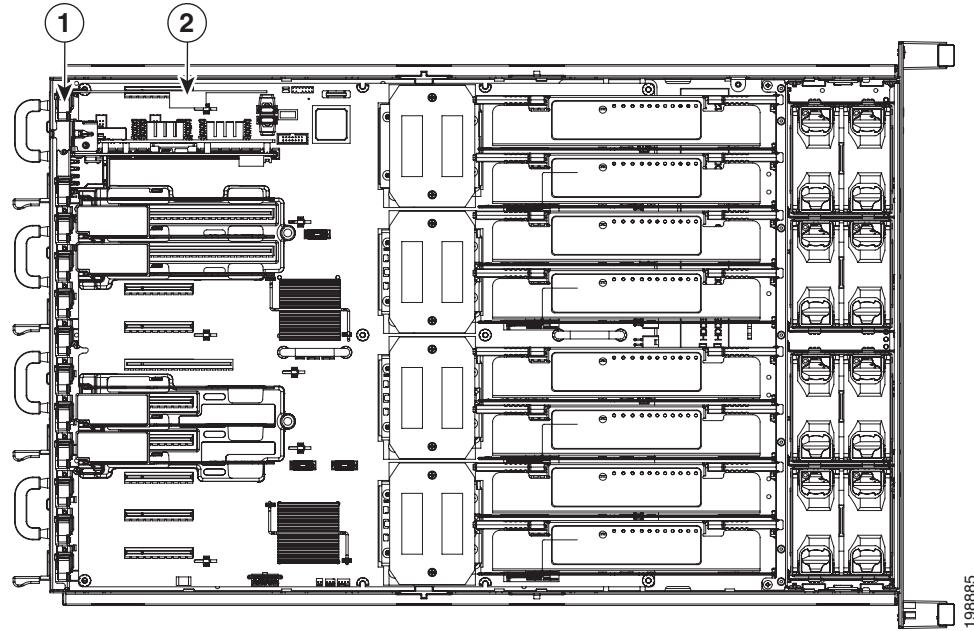
1	Retaining clip	**2**	SAS riser

Figure 3-10   SAS Riser Card Connectors
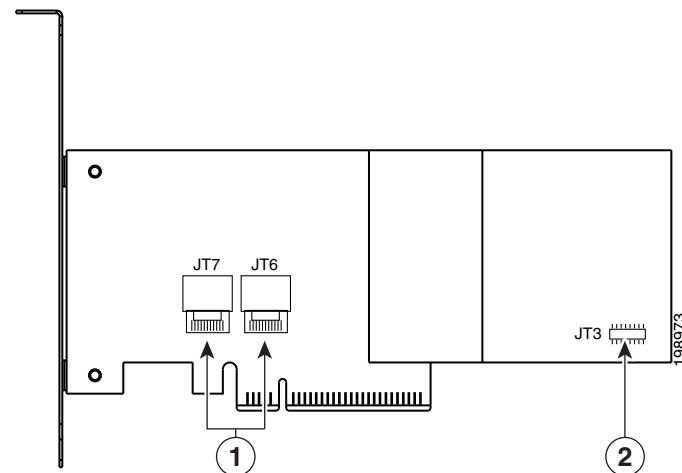
1	SAS cable connectors JT6 = Ports 0 - 3 JT7 = Ports 4 - 7	**2**	LSI BBU connector JT3 (on LSI 9260-8i only)

LSI MegaRAID Card Beep Codes

Table 3-4 contains a summary of the LSI MegaRAID card beep codes. These beep codes indicate activity and changes from the optimal state of your RAID array. For full documentation on the LSI MegaRAID cards and the LSI utilities, refer to the LSI documentation for your card.

Table 3-4   Summary of LSI MegaRAID Card Beep Codes

Beep Code	LSI Firmware State	Cause (Depending on RAID Level)
3 seconds on, 1 second off	SPEAKER_OFFLINE_ENTRY	• RAID 0: One or more drives offline. • RAID 1: Two drives offline. • RAID 5: Two or more drives offline. • RAID 6: More than two drives offline.
1 second on, 1 second off	SPEAKER_DEGRADED_ENTRY	• RAID 1: A mirrored drive failed. • RAID 5: One drive failed. • RAID 6: One or two drives failed.
1 second on, 3 seconds off	SPEAKER_HOTSPARE_ENTRY	A hot spare drive has completed the rebuild process and has been brought into the array.

Replacing the SAS Riser Battery Backup Unit

> **Note** This optional battery backup unit (BBU) is available only when using the optional LSI 9260-8i SAS RAID controller card as the SAS riser. This BBU provides approximately 72 hours of battery backup for the disk write-back cache DRAM in the case of sudden power loss.

To replace the SAS riser BBU, follow these steps:

Step 1 Remove the BBU that you are replacing. See Figure 3-11.

    a. Power off the server as described in the "Shutting Down and Powering Off the Server" section on page 3-6.

    b. Slide the server out the front of the rack far enough so that you can remove the top cover.

> **Note** You might have to detach cables from the rear panel to provide clearance.

> **Caution** If you cannot safely view and access the component, remove the server from the rack.

    c. Remove the top cover as described in the "Removing and Replacing the Server Top Cover" section on page 3-7.

    d. Remove the memory riser that sits closest to the BBU. See Replacing Memory Risers, page 3-23.

    e. Slide the battery assembly toward the front of the chassis to disengage its retaining clips from the chassis wall slots.

    f. Disconnect the cable that is attached to the BBU.

Step 2   Install a new BBU:

    a. Connect the cable from the SAS riser to the replacement BBU.

    b. Insert the two retaining clips on the rear of the BBU into the chassis wall slots and slide the BBU toward the chassis rear until it locks into place.

    c. Replace the memory riser that you removed for clearance. See Replacing Memory Risers, page 3-23.

    d. Replace the top cover.

    e. Replace the server in the rack, replace cables, and then power on the server by pressing the **Power** button.

Figure 3-11   Removing and Replacing the RAID Battery Assembly
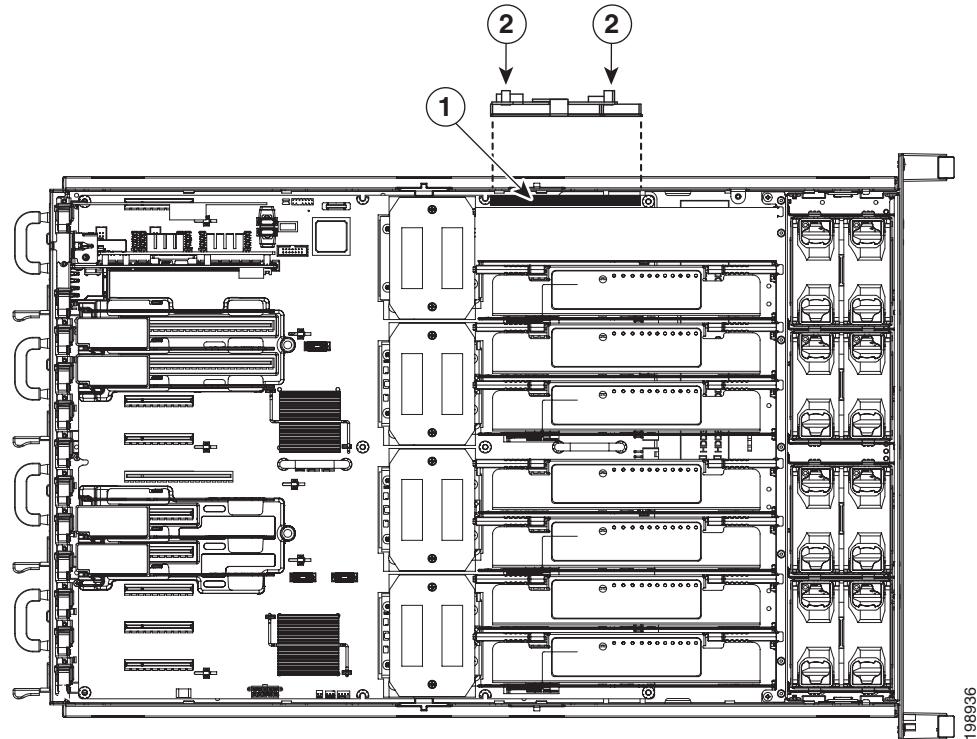
1	BBU position on inside chassis wall	**2**	BBU retaining clips

Replacing the Motherboard CMOS Battery

⚠ Warning   **There is danger of explosion if the battery is replaced incorrectly. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.**
Statement 1015

The CMOS battery retains system settings when the server is disconnected from power. To replace or install the motherboard CMOS battery, follow these steps:

Step 1   Remove the CMOS battery. See Figure 3-12:

   a.   Power off the server as described in the "Shutting Down and Powering Off the Server" section on page 3-6.

   b.   Slide the server out the front of the rack far enough so that you can remove the top cover.

✎ Note   You might have to detach cables from the rear panel to provide clearance.

⚠ Caution   If you cannot safely view and access the component, remove the server from the rack.

   c.   Remove the top cover as described in "Removing and Replacing the Server Top Cover" section on page 3-7.

   d.   Remove the I/O riser to provide clearance. See Replacing the I/O Riser, page 3-11.

   e.   Locate the CMOS battery.

   f.   Bend the battery retaining clip away from the chassis wall and pull the battery from the socket.

Step 2   Install a CMOS battery:

   a.   Bend the retaining clip away from the chassis wall and insert the battery in the socket.

✎ Note   The positive side of the battery marked "+" should face the chassis wall.

   b.   Push the battery into the socket until it is fully seated.

✎ Note   Ensure that the retaining clip clicks over the top of the battery.

   c.   Replace the I/O riser. See Replacing the I/O Riser, page 3-11.

   d.   Replace the top cover.

   e.   Replace the server in the rack, replace cables, and then power on the server by pressing the **Power** button.

Figure 3-12   *Removing and Replacing the Motherboard CMOS Battery*
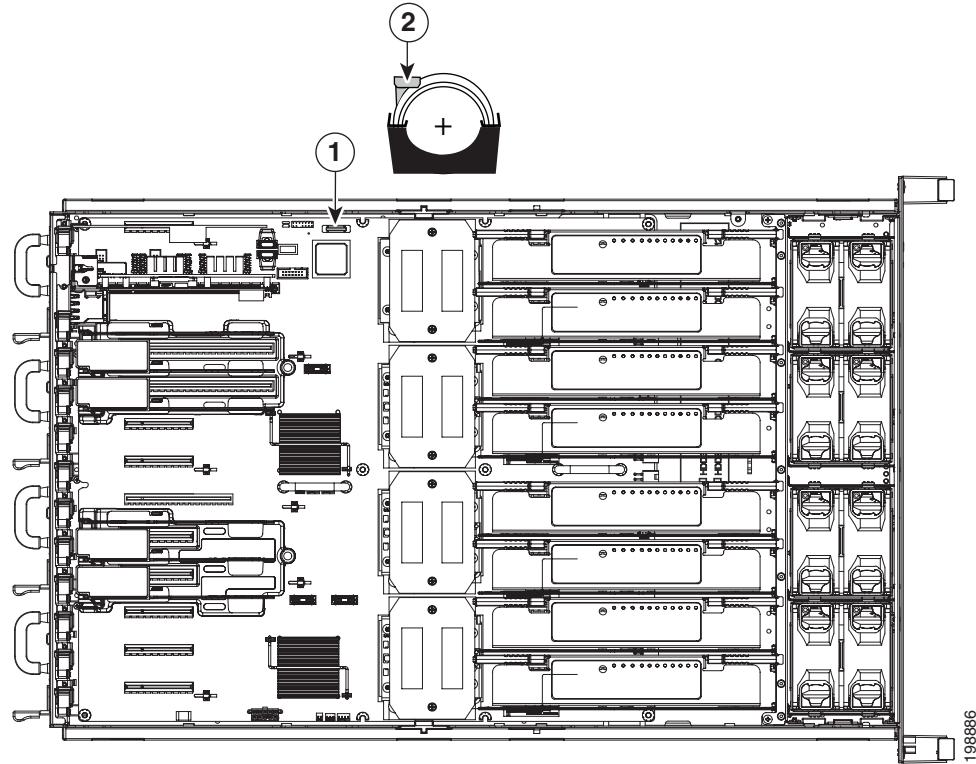
1	CMOS battery socket	**2**	Retaining clip

Replacing CPUs and Heatsinks

This server can operate with 2-, 3-, or 4-CPU configurations. Each CPU supports two memory risers (four memory buffers) connected by serial memory interface (SMI). Each memory buffer has two DDR3 memory bus interfaces.

Note   The minimum CPU configuration is that CPU1 and CPU3 must be installed. See Figure 3-13, which has a view shown facing the front of the server. Only CPU1 and CPU3 are connected to the internal PCIe hub. With CPU1 and CPU3 installed, any other combination operates.

Figure 3-13   CPUs and Memory Risers

CPU 4		CPU 3		CPU 2		CPU 1	
MEM 8	MEM 7	MEM 6	MEM 5	MEM 4	MEM 3	MEM 2	MEM 1

To install or replace a CPU heatsink and CPU, follow these steps:

Step 1   Remove the CPU and heatsink that you are replacing:

a. Power off the server as described in the "Shutting Down and Powering Off the Server" section on page 3-6.

b. Slide the server out the front of the rack far enough so that you can remove the top cover.

Note   You might have to detach cables from the rear panel to provide clearance.

Caution   If you cannot safely view and access the component, remove the server from the rack.

c. Remove the top cover as described in "Removing and Replacing the Server Top Cover" section on page 3-7.

d. Remove all memory risers to uncover the CPU cage screws. See Replacing Memory Risers, page 3-23.

e. Remove all the memory riser dividers by lifting them straight up and sliding them free of the CPU cage. See Figure 3-14.

f. Remove the CPU cage by loosening the six captive screws that secure the cage to the motherboard. See Figure 3-14 for the screw locations.

g. Loosen the two captive screws that secure the heatsink and lift it off of the CPU. See Figure 3-14 and Figure 3-15.

Note   Alternate loosening each screw evenly to avoid damaging the heatsink or CPU.

h. Unclip the CPU retaining lever and lift the CPU retaining lid. See Figure 3-15.

i. Lift the CPU out of the socket and set it aside on an antistatic mat or in an antistatic bag.

Step 2   Install a new CPU:

    a. Insert the replacement CPU in the socket with the arrow on the CPU pointing toward the arrow on the socket.

    b. Close the CPU retaining lid and clip down the CPU retaining lever.

Step 3   Install a heatsink:

> ⚠ **Caution**   The heatsink must have a new, undamaged thermal pad on the heatsink-to-CPU surface to ensure proper cooling. If you are replacing a heatsink that was previously installed, you must remove the old thermal pad. If you are installing a new heatsink, skip to step d. below.

    a. Apply the supplied cleaning solution to the old thermal pad and let it soak for a least 15 seconds.

    b. Wipe all of the old thermal pad off the heatsink using a soft cloth that will not scratch the heatsink surface.

> ⚠ **Caution**   Damage to the heatsink surface can damage the heat transferring properties of the heatsink.

    c. Apply the supplied preparation solution to the center bottom of the heatsink, where the new thermal pad will be applied.

    d. Apply the new thermal pad to the center bottom of the heatsink.

    e. Align the heatsink captive screws with the motherboard standoffs, then tighten the captive screws evenly, until the screws stop against the captive springs.

> ✎ **Note**   Alternate tightening each screw evenly to avoid damaging the heatsink or CPU.

    f. Replace the CPU cage. Align the six captive screws with the holes in the motherboard, then tighten each screw evenly.

    g. Replace the memory riser dividers. Slide each one into the slots on the CPU cage and the chassis.

    h. Replace all memory risers. See Replacing Memory Risers, page 3-23.

    i. Replace the top cover.

    j. Replace the server in the rack, replace cables, and then power on the server by pressing the **Power** button.

Figure 3-14   Locations of CPU Cage Screws and CPUs
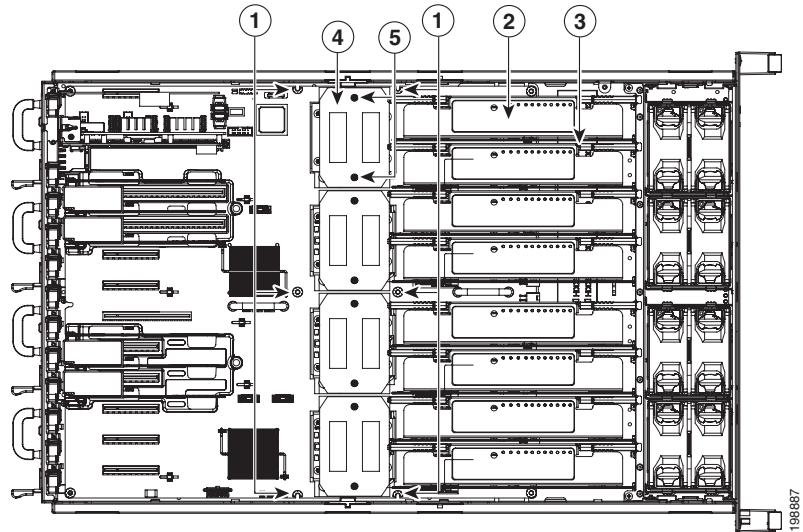
1	CPU cage screw locations (six) on motherboard (cage not shown)	2	Memory risers (eight)
3	Memory riser dividers (eight)	4	CPU heatsink
5	CPU heatsink captive screws (two on each heatsink)		

Figure 3-15   Removing a CPU and Heatsink
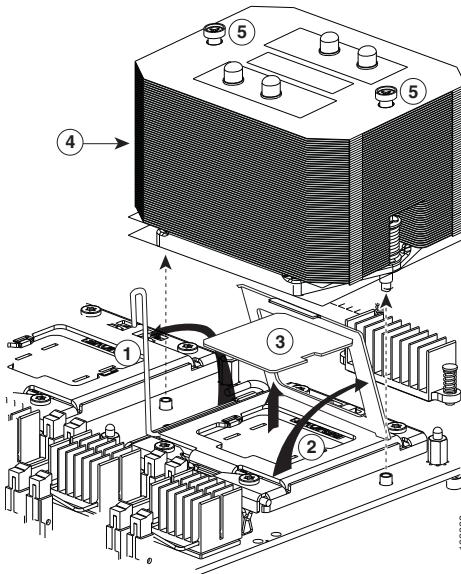
1	CPU retaining lever	2	CPU retaining lid
3	CPU	4	Heatsink
5	Heatsink captive screws (two)		

Replacing Memory Risers

The memory risers connect to the motherboard and each riser provides eight DIMM slots. The memory riser is hot-swappable when you use the Attention button, as described in the following procedure.

Figure 3-16   Memory Riser LEDs (Top View)
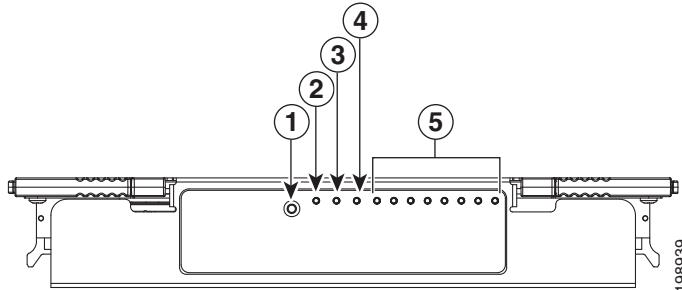
1	Attention button (used for hot-swapping and hot-adding)	**2**	Attention LED (indicates when hot-swapping is safe)
3	Power LED (indicates whether the riser has power)	**4**	Mirror activity LED (indicates whether memory mirroring is enabled)
5	DIMM fault LEDs 1 through 8 (indicate which DIMM has failed)		

To replace or install a hot-swappable memory riser, follow these steps:

Step 1   Remove the memory riser that you are replacing: See Figure 3-17:

  a. Slide the server out the front of the rack far enough so that you can remove the top cover.

  b. Remove the top cover as described in "Removing and Replacing the Server Top Cover" section on page 3-7.

  c. Press the attention button (ATTN BUTTON) on the top of the memory riser (see Figure 3-16).

  d. Wait until the attention LED (ATTN) and the power LED turn off.

  e. Simultaneously press both green release buttons on the top of the memory riser to release the riser retaining latches. The latches open up to a 45-degree angle when they are released.

  f. Grasp the open retaining latches and lift the memory riser straight up and out of the motherboard connector.

  g. If you are installing or replacing DIMMs on the memory riser, use the instructions in Replacing DIMMs, page 3-25.

Step 2   Install (hot-add) a new memory riser:

  a. Ensure that the riser release latches are in the open position.

  a. Align the riser with the empty motherboard connector.

  b. Push the riser into the connector until it is seated and the open release levers engage.

  c. Simultaneously press down on each release lever to put them in the locked position. This ensures that the riser is properly seated in the motherboard connector.

  d. Press the attention button, then wait until the attention LED turns off.

e. Replace the top cover.

f. Replace the server in the rack and replace any cables.

Figure 3-17   Removing and Replacing Memory Risers
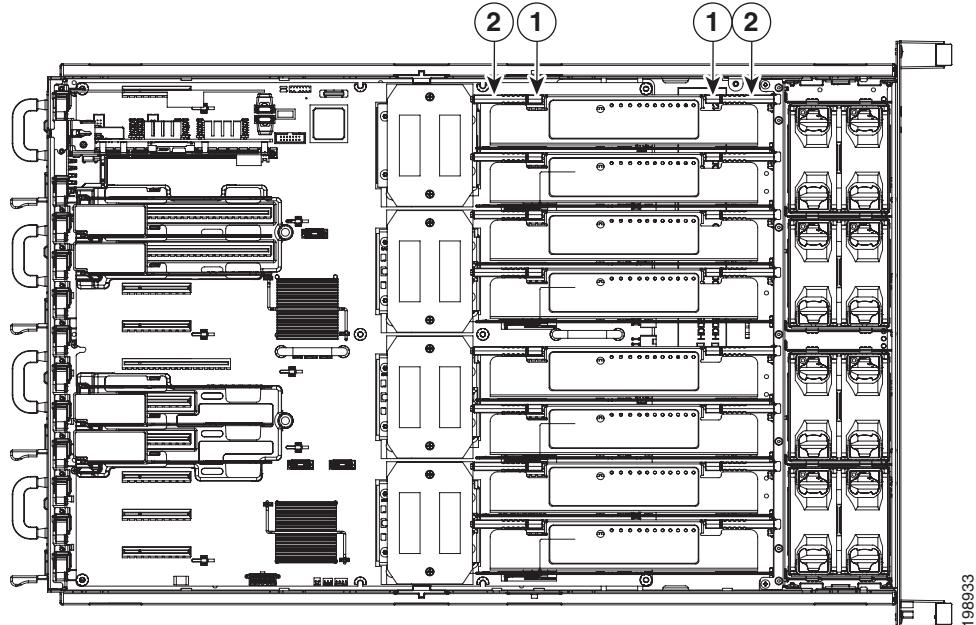
1	Memory riser release buttons	**2**	Memory riser release latches

Replacing DIMMs

This section includes the following sections:

-
-

> **Note** To ensure the best server performance, it is important that you are familiar with memory performance guidelines and population rules before you install or replace memory modules.

Memory Performance Guidelines and Population Rules

This section describes the type of memory that the server requires and its effect on performance. The following topics are covered:

-
-
-

Memory Channels

Each CPU supports two memory risers. Figure 3-18 shows the placement of the CPUs and their corresponding memory risers. The view shown is facing the front of the server. This numbering is also inscribed on the top of the CPU cage.

Figure 3-18   CPUs and Memory Risers

CPU 4		CPU 3		CPU 2		CPU 1	
MEM 8	MEM 7	MEM 6	MEM 5	MEM 4	MEM 3	MEM 2	MEM 1

Each memory riser contains two memory buffers that are connected to the CPU by serial memory interface (SMI) channels. Each memory buffer has two channels, each containing a pair of DDR3 DRAM slots.

In Figure 3-19, the buffers and channels are:

- Buffer 1, channel 1: slots 1B and 1D
- Buffer 1, channel 2: slots 1A and 1C
- Buffer 2, channel 1: slots 2B and 2D
- Buffer 2, channel 2: slots 2A and 2C

Figure 3-19   *DIMM Slots and Memory Buffers*
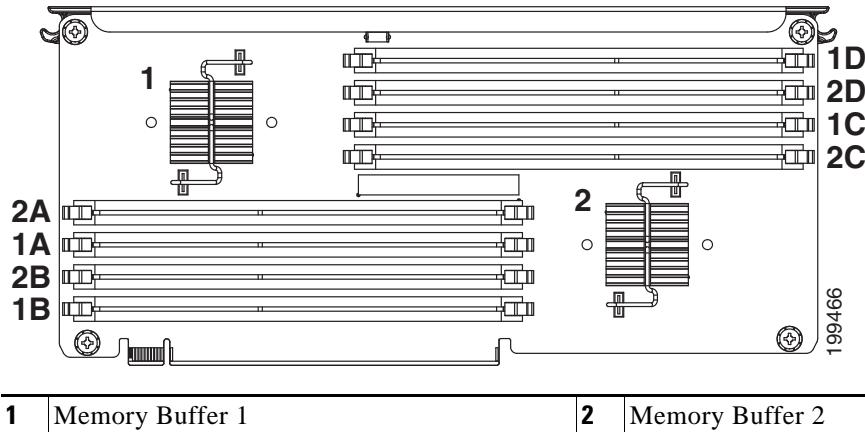
1	Memory Buffer 1	2	Memory Buffer 2

DIMM Population Rules

Following are the DIMM population rules:

- The minimum configuration for the server is, at least one matched DIMM pair installed in a memory riser on either CPU1 or CPU2 (see Figure 3-18). All four CPUs can run from a single DIMM pair.

- DIMMs are required to be populated in pairs. DIMMs for this server are sold as two-DIMM kits.

- The DIMMs in any given pair must be identical.

- Any DIMM installed in a memory riser corresponding to an empty CPU slot becomes inaccessible.

- For optimal performance, distribute DIMMs evenly across all installed CPUs and memory buffers.

- DIMMs within a channel are populated starting with the DIMMs farthest from the memory buffer in a fill-farthest approach.

  For example, the order that you should populate the four channels on a memory riser is as follows (see also Figure 3-19):

  1. Slots 1B and 1D

  2. Slots 1A and 1C

  3. Slots 2B and 2D

  4. Slots 2A and 2C

DIMM and Rank Sparing

DIMM and rank sparing can be enabled in the BIOS configuration utility.

Sparing involves utilizing one of the DIMM pairs or rank pairs within each memory riser as a spare unit. When any of the other DIMM pairs within the same memory riser experiences errors beyond a pre-defined threshold, it fails over to the spare DIMM pair. Spared DIMMs and ranks are hidden from the user and the OS so that the BIOS can migrate to a spare unit when it finds degrading DIMMs.

When sparing is enabled, the available system memory is lesser than the total installed memory.

- When using DIMM sparing, the available memory equals total installed memory minus the size of spared DIMMs.

- When using rank sparing, available memory equals total installed memory minus the size of the spared ranks. Rank size equals DIMM size divided by the number of ranks.

DIMM Installation Procedure

This section contains the following topics:

- Identifying a Faulty DIMM, page 3-27
- DIMM Replacement Procedure, page 3-27

Identifying a Faulty DIMM

The memory riser has LEDs on it supper surface that can assist you in isolating a faulty DIMM. The faulty DIMMs are indicated by the DIMM fault LEDs, which light amber to indicate which DIMMs are faulty. See Figure 3-20.

Figure 3-20   Memory Riser LEDs (Top View)
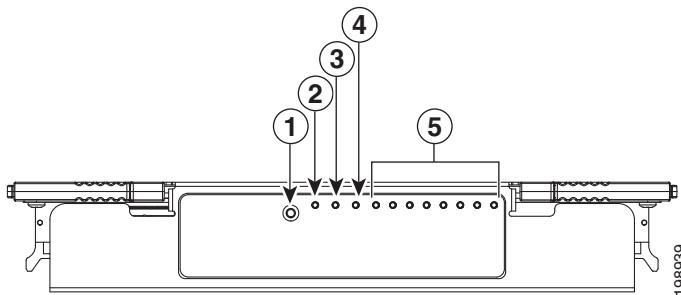
1	Attention button (used for hot-swapping)	2	Attention LED (indicates when hot-swapping is safe)
3	Power LED (indicates whether the riser has power)	4	Mirror activity LED (indicates whether memory mirroring is enabled)
5	DIMM fault LEDs 1 through 8 (indicate which DIMM has failed)		

DIMM Replacement Procedure

To install a DIMM assembly, follow these steps:

Note DIMM risers are hot-swappable when you use the attention button, so you do not have power off the server or disconnect power cords. Use the following procedure.

Step 1 Remove the DIMMs that you are replacing: See Figure 3-21:

a. Slide the server out the front of the rack far enough so that you can remove the top cover.

Note You might have to detach cables from the rear panel to provide clearance.

Caution If you cannot safely view and access the component, remove the server from the rack.

b. Remove the top cover as described in "Removing and Replacing the Server Top Cover" section on page 3-7.

c. Press the attention button (ATTN BUTTON) on the top of the memory riser that contains the faulty DIMM (see Figure 3-20).

d. Wait until the attention LED (ATTN) and the power LED turn off.

e. Simultaneously press both green release buttons on the top of the memory riser to release the riser retaining latches. The latches open up to a 45-degree angle when they are released.

f. Lift the memory riser straight up and out of the motherboard connector.

g. Locate the faulty DIMM and remove it from the connector on the memory riser.

Step 2 Install a new DIMM:

a. Insert the DIMM assembly in the connector.

b. Push the DIMM into the connector until it is seated properly, and the white clips on either side of the connector lock into place.

c. Push the hot-addable memory riser into the motherboard connector until it is seated and the open release levers engage the chassis and the CPU cage.

d. Simultaneously press down on each release lever to put them in the closed position. This ensures that the riser is properly seated in the motherboard connector.

e. Press the attention button on the top of the memory riser, then wait until the attention LED turns off (see Figure 3-20).

f. Replace the top cover.

g. Replace the server in the rack and replace any cables.

Figure 3-21   Removing and Replacing DIMMs

1	DIMM slots	2	Memory riser
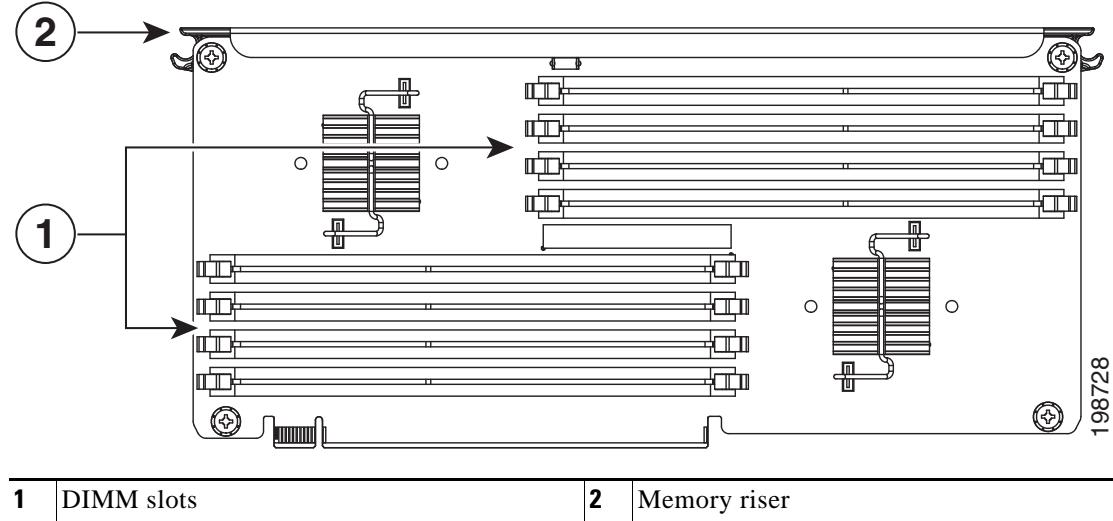
Replacing Fan Modules

The eight fan modules in the server are numbered as follows when you are facing the front of the server. Each fan module has a fault LED that lights amber when the fan module fails.

Figure 3-22   Fan Module Numbering

FAN 8	FAN 7	FAN 6	FAN 5
FAN 4	FAN 3	FAN 2	FAN 1

To replace or install a hot-pluggable fan module, follow these steps:

⚠️
Caution   You do not have to shut down or power off the server to replace fan modules because they are hot-pluggable. However, to maintain proper cooling, do not operate the server for more than one minute with any fan module removed.

Step 1   Remove the fan module that you are replacing: See Figure 3-23:

a. Slide the server out the front of the rack far enough so that you can remove the top cover.

✎
Note   You might have to detach cables from the rear panel to provide clearance.

⚠️
Caution   If you cannot safely view and access the component, remove the server from the rack.

b. Remove the top cover as described in "Removing and Replacing the Server Top Cover" section on page 3-7.

c. Insert your thumb and forefinger in the two green release latches on top of the fan module.

d. Squeeze the release latches together and lift out the fan module.

Step 2   Install a new fan module:

a. Grasp the fan module by the release latches and align it with the empty fan bay and the motherboard connector.

✎
Note   As you face the front of the server, the connector on underside of the fan module should be oriented on the right-bottom side of the fan module. See Figure 3-23.

b. Press down on the top corners of the fan module until the connector is fully seated and the release latches lock in place.

c. Replace the top cover.

d. Replace the server in the rack.

Figure 3-23 **Removing and Replacing Fan Modules**
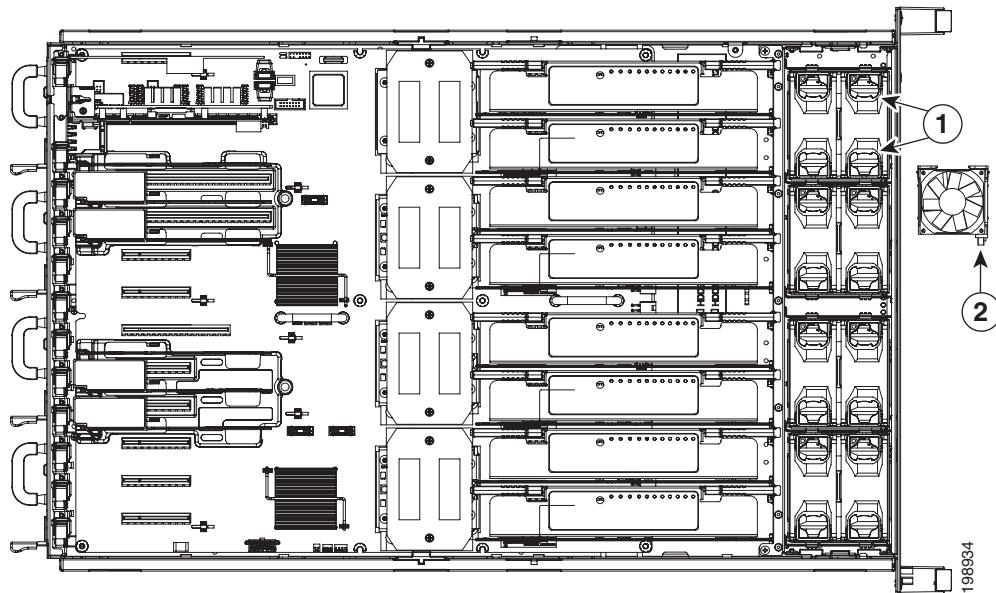
1	Fan module release latches	**2**	Fan module, front view showing connector on underside of the module

Replacing Hard Drives or Solid State Drives

Tip   You can mix SAS and SATA drives in the same server.

Note   You can mix hard drives and solid state drives (SSDs) in the same server. However, You cannot configure a logical volume (virtual drive) that contains a mix of hard drives and SSDs. That is, when you create a logical volume, it must contain all hard drives or all SSDs.

Tip   You do not have to shut down or power off the server to replace hard drives or SSDs because they are hot pluggable.

To replace or install a hot-pluggable hard drive, follow these steps:

Step 1   Remove the drive that you are replacing or remove a blank panel from an empty bay (See Figure 3-24):

   a.   Press the release button on the face of the hard drive.

   b.   Grasp the ejector lever and pull the hard drive tray out of the slot.

   c.   If you are replacing an existing drive, remove the four drive tray screws that secure the drive to the tray and then lift the drive out of the tray.

Step 2   Install a new drive:

  a. Place a new hard drive in the empty drive tray and replace the four drive tray screws.

  b. Insert the drive tray into the empty drive bay.

  c. Push the tray into the slot until the drive connectors are fully seated in the backplane.

  d. Press the ejector lever flat to lock the drive and tray in place.

Figure 3-24   Removing and Replacing Hard Drives

1	Ejector lever	2	Release button
3	Drive tray securing screws		
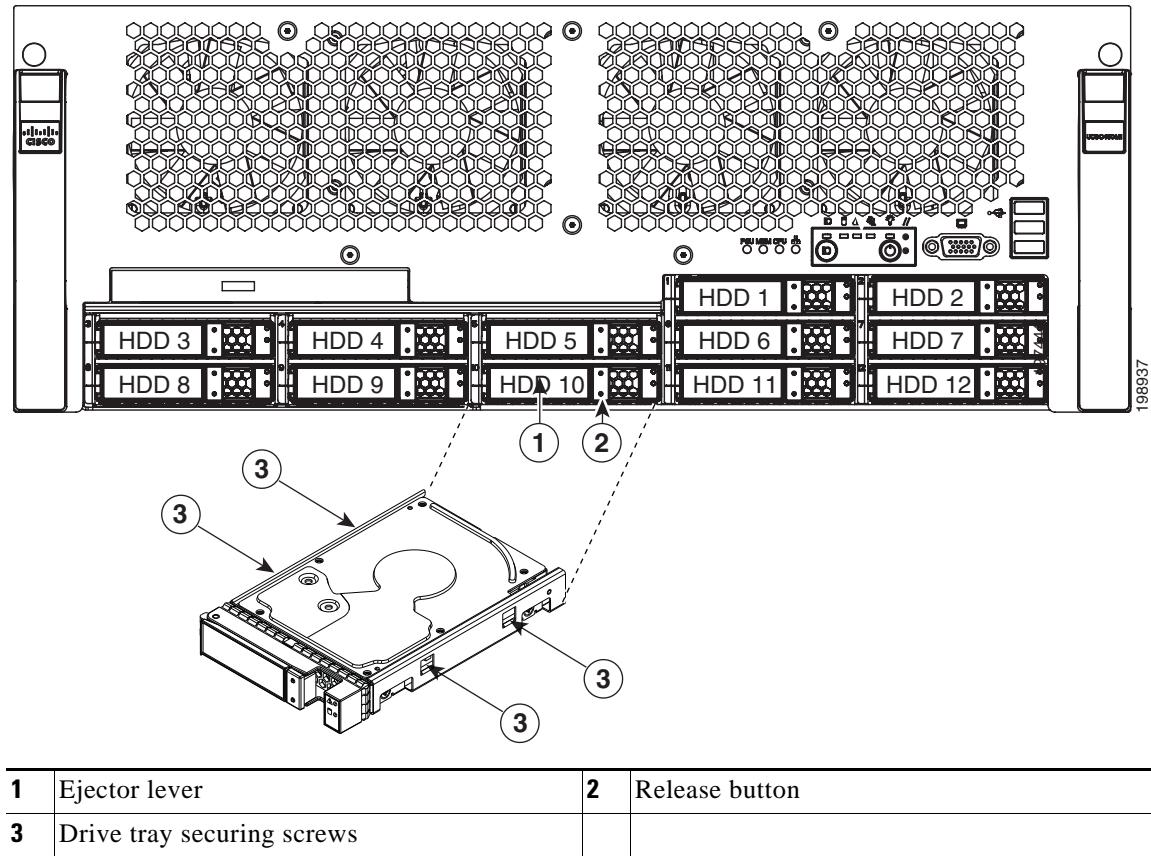
Replacing a DVD Drive

⚠ **Warning**   **Class 1 laser product.**
Statement 1008

To replace or install a DVD drive, follow these steps:

Step 1   Remove the DVD drive that you are replacing. See Figure 3-25:

   a.   Power off the server as described in Shutting Down and Powering Off the Server, page 3-6.

   b.   Slide the server out the front of the rack far enough so that you can remove the top cover.

⚠ **Caution**   If you cannot safely view and access the component, remove the server from the rack.

   c.   Remove the top cover as described in Removing and Replacing the Server Top Cover, page 3-7.

   d.   Remove all memory risers. See Replacing Memory Risers, page 3-23.

   e.   Remove all memory riser dividers.

   f.   Remove the black plastic cover from the floor of the chassis by removing the four screws that secure it. This strip covers the width of the chassis floor behind the fan modules.

   g.   Push the release button on the rear of the DVD drive, and then push the DVD drive out the front panel.

Step 2   Install a new DVD drive:

   a.   Insert the rear of the new DVD drive into the empty DVD drive bay on the front panel.

   b.   Push the drive inward until it seats in its connector and the release button locks in place.

   c.   Replace the black strip to the floor of the chassis by replacing its four screws.

   d.   Replace all memory riser dividers.

   e.   Replace all memory risers.

   f.   Replace the top cover.

   g.   Replace the server in the rack, replace cables, and then power on the server by pressing the **Power** button.

Figure 3-25   Removing and Replacing the DVD Drive
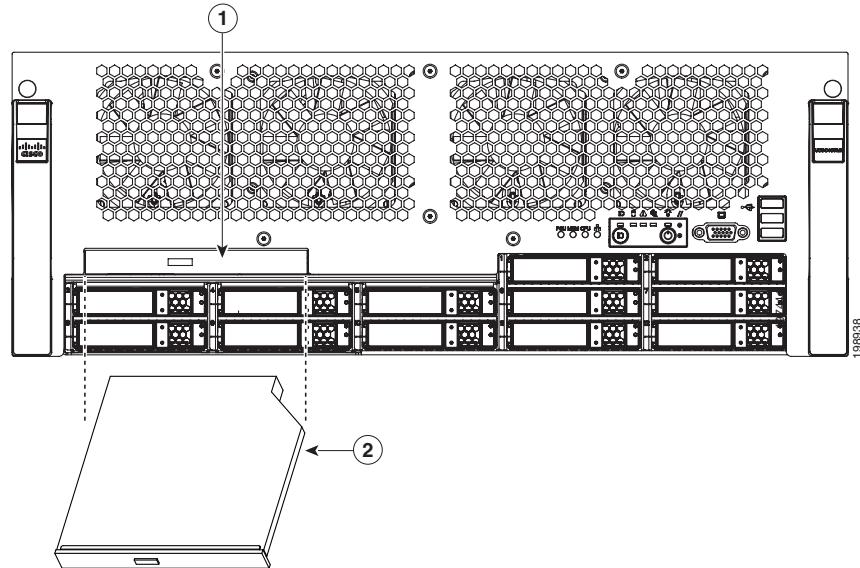
1	DVD drive bay	**2**	Rear of DVD drive

Replacing a PCIe Card

Note   If you are installing a Cisco UCS P81E Virtual Interface Card (N2XX-ACPCI01), there are prerequisite considerations. See Special Considerations for the Cisco UCS P81E Virtual Interface Card (N2XX-ACPCI01), page 3-37.

This server has 10 PCIe expansion slots. See Figure 3-26 and Table 3-5 for information about the slots and which slots are hot-swappable.

The replacement procedures differ depending on whether the PCIe slot is hot-swappable or not. This section contains two procedures:

- Replacing a PCIe Card in a Non Hot-Swappable Slot, page 3-35
- Replacing a PCIe Card in a Hot-Swappable Slot, page 3-36

Figure 3-26   PCIe Slots
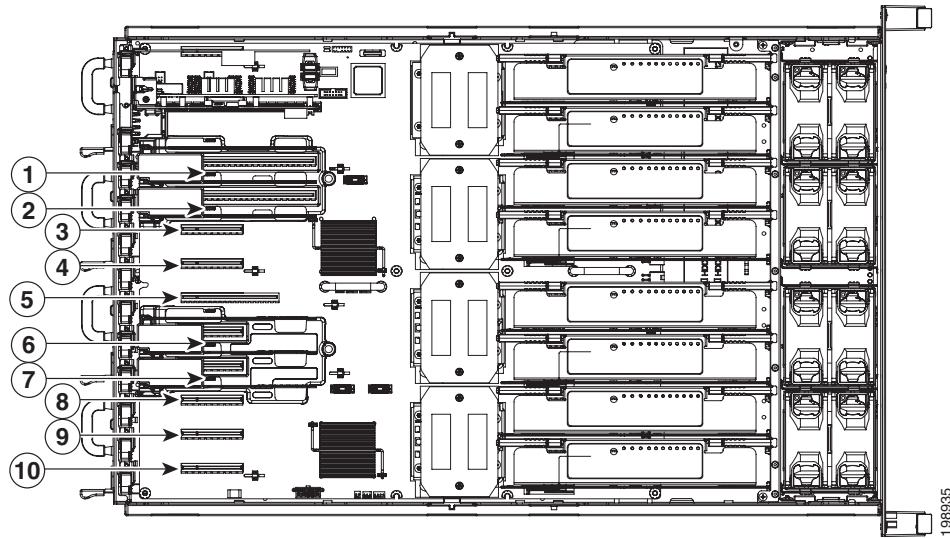
Table 3-5   PCIe Expansion Slots

Slot Number	Description
1	PCI-Express Gen-2x8, ¾ length, x24 connector, hot-swappable
2	PCI-Express Gen-2x8, ¾ length, x24 connector, hot-swappable
3	PCI-Express Gen-2x4, ½ length, x8 connector
4	PCI-Express Gen-2x4, ½ length, x8 connector
5	PCI-Express Gen-2x16, ¾ length, x16 connector
6	PCI-Express Gen-2x8, ¾ length, x8 connector, hot-swappable
7	PCI-Express Gen-2x8, ¾ length, x8 connector, hot-swappable
8	PCI-Express Gen-1x4, ¾ length, x8 connector
9	PCI-Express Gen-1x4, ½ length, x8 connector
10	PCI-Express Gen-2x4, ½ length, x8 connector

"Gen *n*x*n*" is the electrical lane width and "x*n* connector" is the mechanical length of the connector. The card length is the supported length because of internal clearance. All PCIe slots are standard-height and require a standard-height mounting bracket on the PCIe card.

CPU3 must be installed to support PCIe slots 5, 6, 7, 9, and 10.

Legacy I/O devices like video cards are only supported on slots 1, 2, 3, 4 and 8.

Replacing a PCIe Card in a Non Hot-Swappable Slot

To install or replace a PCIe card in slots 3, 4, 5, 8, 9, or 10, follow these steps:

Step 1 Remove a PCIe card:

   a. Shut down and power off the server as described in the "Shutting Down and Powering Off the Server" section on page 3-6.

   b. Slide the server out the front of the rack far enough so that you can remove the top cover.

> **Note** You might have to detach cables from the rear panel to provide clearance.

> **Caution** If you cannot safely view and access the component, remove the server from the rack.

   c. Remove the top cover as described in the "Removing and Replacing the Server Top Cover" section on page 3-7.

   d. Remove any cables from the ports of the PCIe card that you are replacing.

> **Tip** Label the cables when you disconnect them to aid correct connection to the new card.

   e. Pinch and lift up the green retaining clip that secures the card to the chassis rear panel.

   f. Lift the card straight up from the motherboard connector.

> **Note** Lift up on both ends of the card evenly to avoid damaging its connector.

Step 2 Install a PCIe card:

   a. Align the PCIe card with the empty PCIe connector on the motherboard.

   b. Push down evenly on both ends of the card until it is fully seated in the motherboard connector.

   c. Ensure that the card rear panel sits flat against the server back panel opening.

   d. Push the green retaining clip down until it locks over the top of the card.

   e. Replace the top cover.

   f. Replace the server in the rack, replace cables, and then power on the server by pressing the **Power** button.

Replacing a PCIe Card in a Hot-Swappable Slot

To install or replace a PCIe card in slots 1, 2, 6, or 7, follow these steps:

Step 1 Remove a hot-swappable PCIe card:

a. Slide the server out the front of the rack far enough so that you can remove the top cover.

Note You might have to detach cables from the rear panel to provide clearance.

Caution If you cannot safely view and access the component, remove the server from the rack.

b. Remove the top cover as described in the "Removing and Replacing the Server Top Cover" section on page 3-7.

c. Remove any cables from the ports of the PCIe card that you are replacing.

Tip Label the cables when you disconnect them to aid correct connection to the new card.

d. Press the lightpipe switch that is on the top of the plastic divider for the hot-swappable PCIe slot.

Note Wait for the lightpipe switch LED to turn off before removing the card in the next step.

e. Pinch and lift up the green retaining clip that secures the card to the chassis rear panel.

f. Lift the card straight up from the motherboard connector.

Note Lift up on both ends of the card evenly to avoid damaging its connector.

Step 2 Install a hot-swappable PCIe card:

a. Align the PCIe card with the empty PCIe connector on the motherboard.

b. Push down evenly on both ends of the card until it is fully seated in the motherboard connector.

c. Ensure that the card rear panel sits flat against the server back panel opening.

d. Push the green retaining clip down until it locks over the top of the card.

e. Press the lightpipe switch that is on top of the plastic divider for the hot-swappable PCIe slot. Wait for the LED to turn on to ensure that the PCIe slot receives power.

f. Replace the top cover.

g. Replace the server in the rack and replace cables.

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Special Considerations for the Cisco UCS P81E Virtual Interface Card (N2XX-ACPCI01)

The Cisco UCS P81E Virtual Interface Card is a standard-profile, half-length, dual-port 10 Gb PCIe card with SFP+. See the following special considerations and prerequisites.

- This server supports installation of up to two of these cards.

- These cards are supported only in PCIe slots 1 and 2 of this server.

Note This card must be installed in PCIe slot 1 to use the Cisco Card NIC mode (see Figure 3-26 on page 3-34). See also NIC Modes and NIC Redundancy Settings, page 2-11.

- This card requires that the server has CIMC firmware version 1.2(1) or later installed. There is a heartbeat LED on the top and bottom of the card that indicates when firmware is active.

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APPENDIX **A**

Server Specifications

This appendix lists the technical specifications for the Cisco UCS C460 server and includes the following sections:

- Physical Specifications, page A-1
- Environmental Specifications, page A-2
- Power Specifications, page A-2

Physical Specifications

Table A-1 lists the physical specifications for the server.

Table A-1   Physical Specifications

Description	Specification
Height	6.8 in (174 mm)
Width	16.7 in (424 mm)
Depth	27.7 in (704 mm)
Weight	110.23 lbs (50 kg)

⚠️
Caution   The Cisco UCS C460 server weighs approximately 110 pounds, or 50 kilograms, when fully loaded with components. We recommend that you use a minimum of two people when lifting the server. Attempting to lift the Cisco UCS C460 server alone could result in personal injury or equipment damage.

Environmental Specifications

Table A-2 lists the environmental specifications for the server.

Table A-2   Environmental Specifications

Description	Specification
Temperature, operating	10ºC to 35ºC (50ºF to 95ºF)
Temperature, non-operating	-40ºC to 70ºC (-40ºF to 158ºF)
Humidity, non-operating	95%, non-condensing at temperatures of 25ºC (77ºF) to 30ºC (86ºF)
Altitude	-30m to 1500m (-100ft to 5000ft)

Power Specifications

Table A-3 lists the specifications for each power supply.

Table A-3   Power Supply Specifications

Description	Specification
AC input voltage	115 to 230 VAC nominal (Range: 90 to 264 VAC)
AC input frequency	50 to 60 Hz nominal (Range: 47 to 63 Hz)
Maximum AC-input current	10A
Maximum output power for each power supply	850W (up to four power supplies can be installed)
Power supply output voltage	Main power: 12 VDC Standby power: 3.3 VDC

You can get more specific power information for your exact server configurationby using the Cisco UCS Power Calculator:

http://www.cisco.com/assets/cdc_content_elements/flash/dataCenter/cisco_ucs_power_calculator/

A P P E N D I X **B**

Cable and Power Cord Specifications

This appendix provides cabling and port specifications for control devices and power connections and includes the following sections:

- KVM Cable, page B-1
- Supported Power Cords and Plugs, page B-2

KVM Cable

The KVM cable provides a connection into the server, providing a DB9 serial connector, a VGA connector for a monitor, and dual USB ports for a keyboard and mouse. With this cable, you can create a direct connection to the operating system and the BIOS running on the server.

This server supports the following Cisco components and part numbers.

Supported Components	Part Number
KVM cable	37-1016-01

Figure B-1 **KVM Cable**
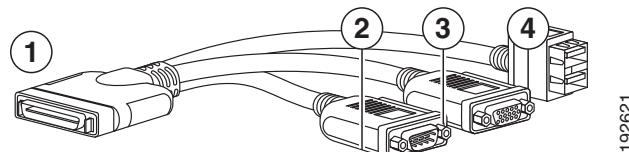
1	Connector to server	2	DB9 serial connector
3	VGA connection for a monitor	4	Two-port USB connector for a mouse and keyboard

Supported Power Cords and Plugs

Each power supply has a separate power cord. Standard power cords or jumper power cords are available for connection to a power distribution unit that has IEC 60320 C19 outlet receptacles. The jumper power cords, for use in racks, are available as an optional alternative to the standard power cords. For more information, contact your Cisco Technical Support.

The standard power cords have an IEC C19 connector on the end that plugs into the Power Distribution Unit (PDU), which is located in the bottom slot at the rear of the chassis. The optional jumper power cords have an IEC C19 connector on the end that plugs into the chassis' PDU and an IEC C20 connector on the end that plugs into an IEC C19 outlet receptacle.

Note Only the approved power cords or jumper power cords provided with the server are supported.

Table B-1 lists the power cords for the server power supplies

Table B-1   Supported Power Cords for the Server

Description	Length		Power Cord Reference Illustration
	Feet	Meters	
SFS-250V-10A-AR Power Cord, 250 VAC 10 A IRAM 2073 Plug Argentina	8.2	2.5	Figure B-2
CAB-9K10A-AU 250 VAC 10 A 3112 Plug, Australia	8.2	2.5	Figure B-3
SFS-250V-10A-CN Power Cord, 250 VAC 10 A GB 2009 Plug China	8.2	2.5	Figure B-4
CAB-9K10A-EU Power Cord, 250 VAC 10 A M 2511 Plug Europe	8.2	2.5	Figure B-5
SFS-250V-10A-ID Power Cord, 250 VAC 16A EL-208 Plug South Africa, United Arab Emirates, India	8.2	2.5	Figure B-6
SFS-250V-10A-IS Power Cord, 250 VAC 10 A SI32 Plug Israel	8.2	2.5	Figure B-7
CAB-9K10A-IT Power Cord, 250 VAC 10 A CEI 23-16 Plug Italy	8.2	2.5	Figure B-8
CAB-9K10A-SW Power Cord, 250 VAC 10 A MP232 Plug Switzerland	8.2	2.5	Figure B-9
CAB-9K10A-UK Power Cord, 250 VAC 10 A BS1363 Plug (13 A fuse) United Kingdom	8.2	2.5	Figure B-10

Table B-1   Supported Power Cords for the Server (continued)

Description	Length		Power Cord Reference Illustration
	Feet	**Meters**	
CAB-AC-250V/13A Power Cord, 250 VAC 13 A IEC60320 Plug North America	6.6	2.0	Figure B-11
CAB-N5K6A-NA Power Cord, 250 VAC 13 A NEMA 6-15 Plug, North America	8.2	2.5	Figure B-12
CAB-C13-C14-JMPR Cabinet Jumper Power Cord, 250 VAC 13 A, C13-C14 Connectors	2.2	0.7	Figure B-13

AC Power Cord Illustrations

This section contains the AC power cord illustrations.

Figure B-2   SFS-250V-10A-AR
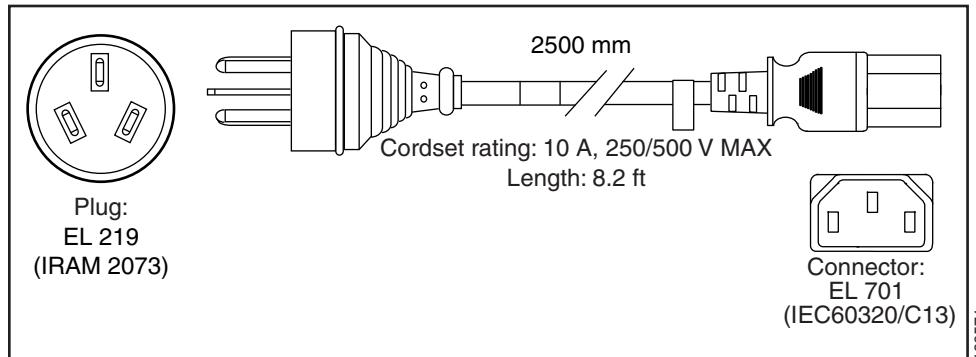
Figure B-3   CAB-9K10A-AU
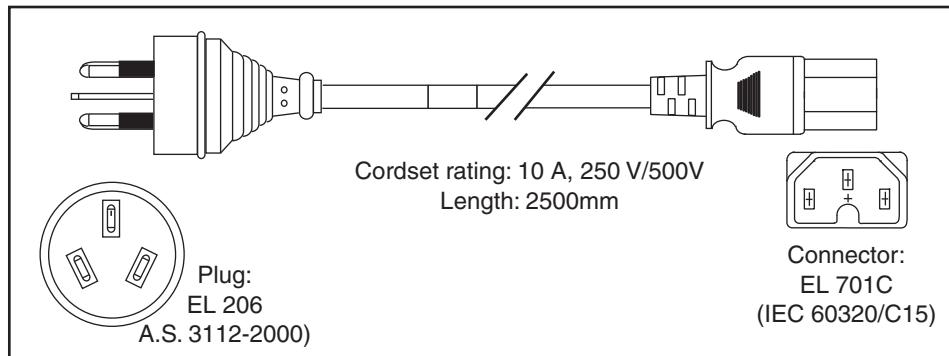
Figure B-4   *SFS-250V-10A-CN*

Plug:
EL 218
(CCEE GB2009)

Cordset rating 10A, 250V
(2500 mm)

Connector:
EL 701
(IEC60320/C13)

186573

Figure B-5   *CAB-9K10A-EU*

Plug:
M2511

Cordset rating: 10A/16 A, 250 V
Length: 8 ft 2 in. (2.5 m)

Connector:
VSCC15

186576
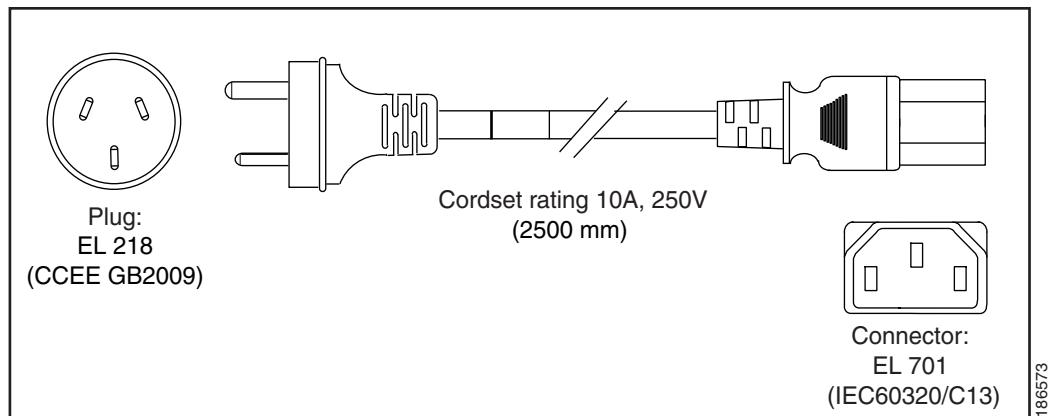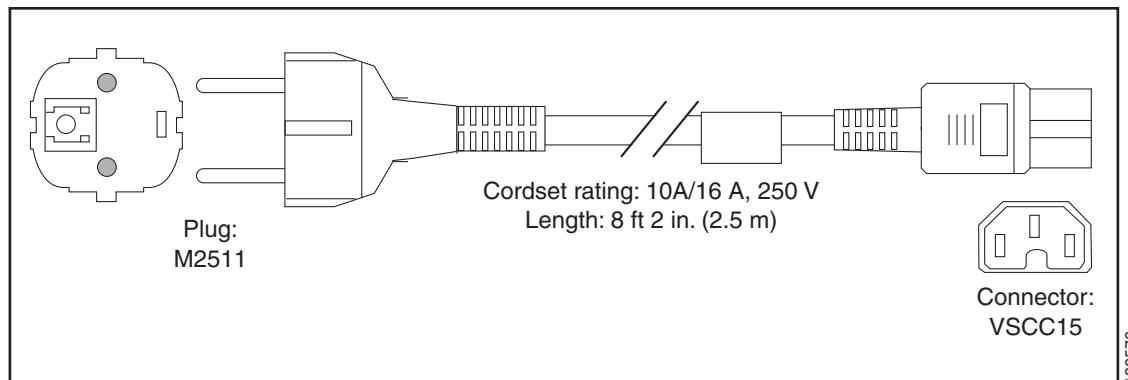
Figure B-6   *SFS-250V-10A-ID*

Plug:
EL 208

Cordset rating 16A, 250V
(2500mm)

Connector:
EL 701

187490

Figure B-7   *SFS-250V-10A-IS*

Cordset rating 10A, 250V/500V MAX
(2500 mm)

Plug:
EL 212
(SI-32)

Connector:
EL 701B
(IEC60320/C13)

Figure B-8   *CAB-9K10A-IT*

Cordset rating: 10 A, 250 V
Length: 8 ft 2 in. (2.5 m)

Plug:
I/3G
(CEI 23-16)

Connector
C15M
(EN60320/C15)
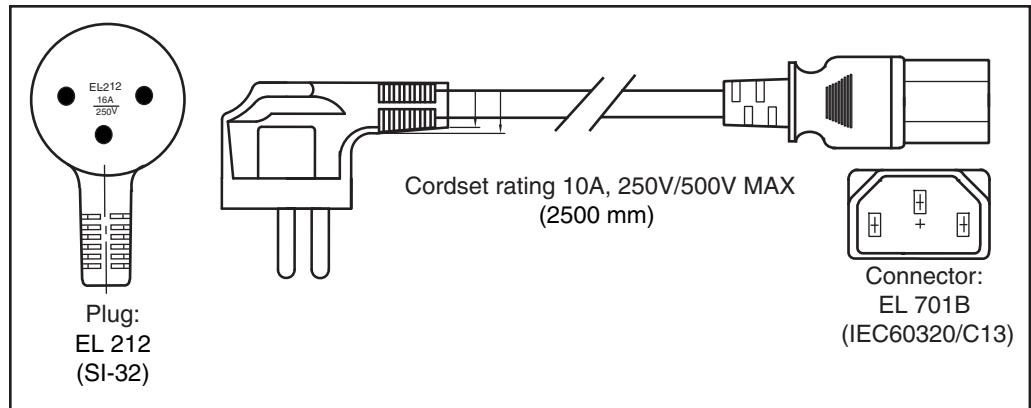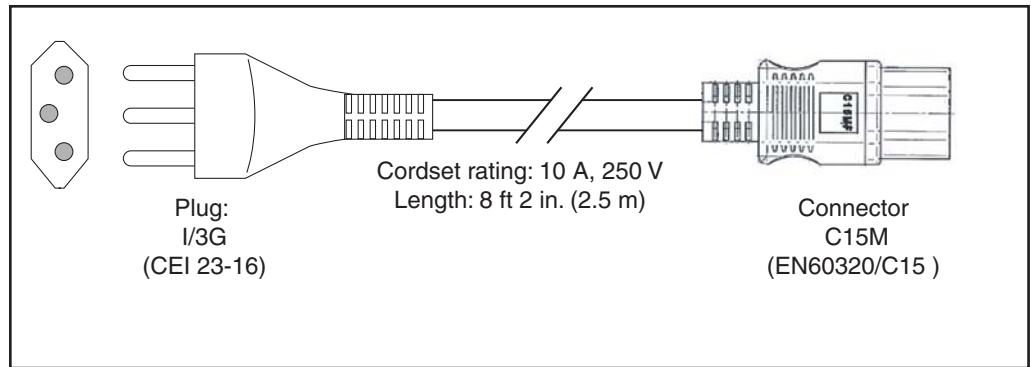
Figure B-9   *CAB-9K10A-SW*

Cordset rating: 10 A, 250 V
Length: 8 ft. 2 in (2.5 m)

Plug:
MP232-R

Connector:
IEC 60320 C15

Figure B-10   *CAB-9K10A-UK*

Cordset rating: 10 A, 250 V/500 V MAX
Length: 2500mm

Plug:
EL 210
(BS 1363A) 13 AMP fuse

Connector:
EL 701C
(EN 60320/C15)

186580
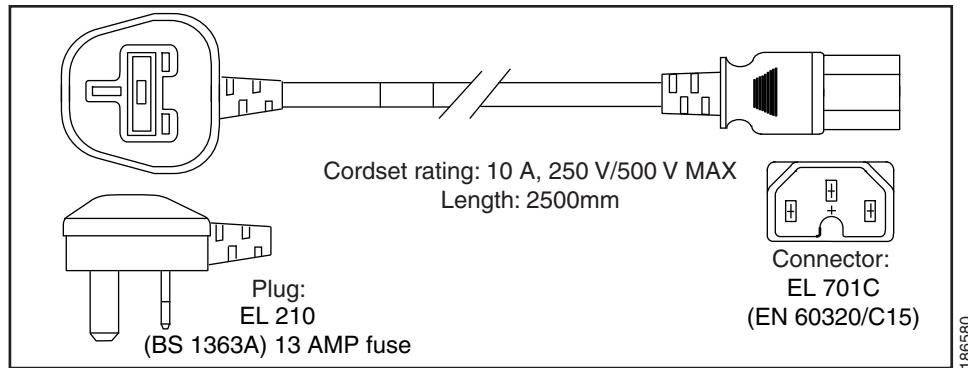
Figure B-11   *CAB-AC-250V/13A*

Cordset rating 13A, 250V
(6.6 feet) (79±2m)

Plug:
EL312MoldedTwistlock
(NEMA L6-20)

Connector:
EL 701
(IEC60320/C13)

186568
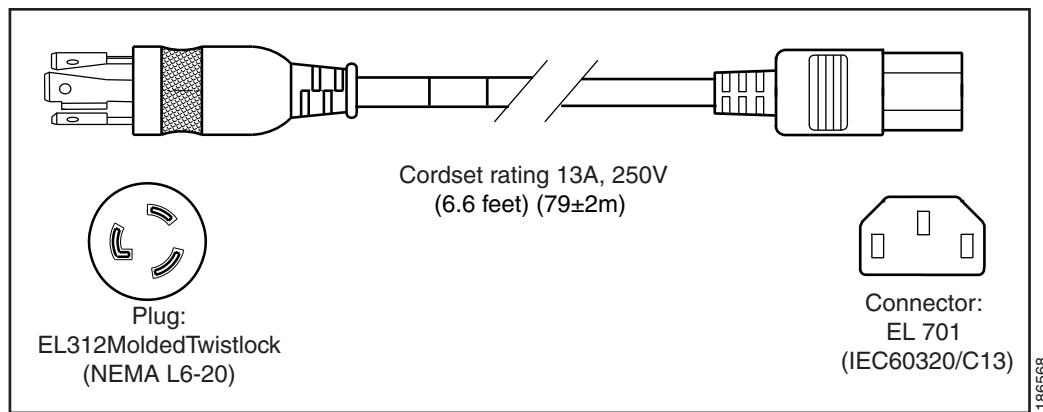
Figure B-12   *CAB-N5K6A-NA*

Plug: NEMA 6-15P

Cordset rating: 10 A, 250 V
Length: 8.2 ft

Connector:
IEC60320/C13

186570
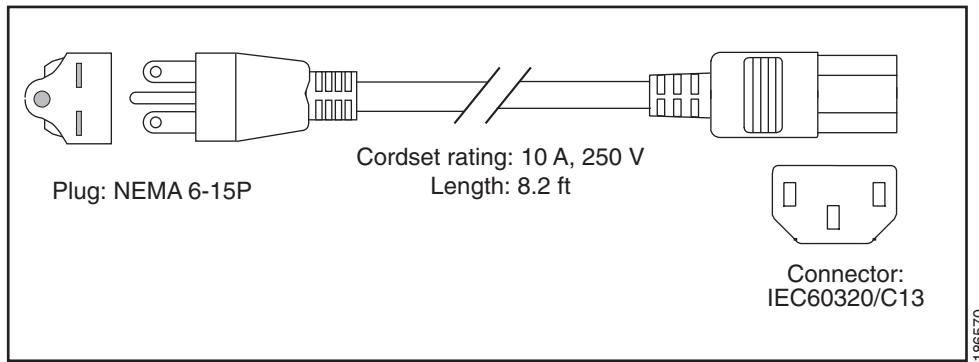
Figure B-13   *CAB-C13-C14-JMPR, Jumper Power Cord*
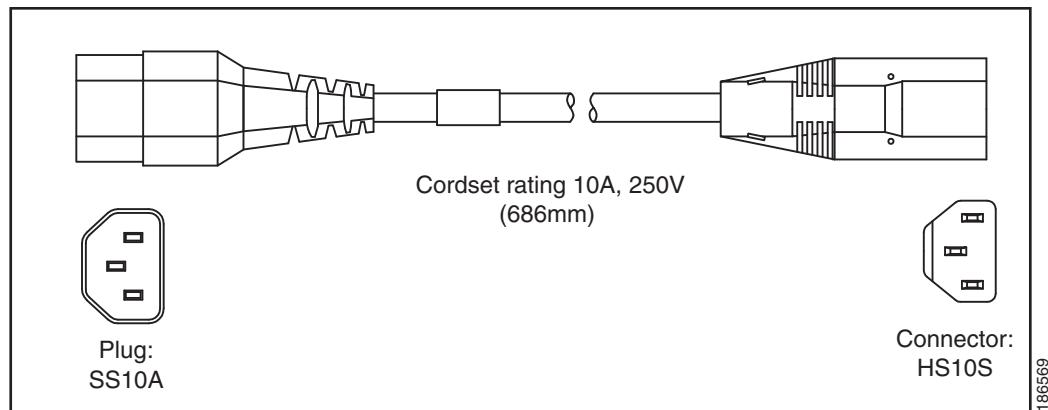
Cordset rating 10A, 250V
(686mm)

Plug:
SS10A

Connector:
HS10S

186569

A P P E N D I X **C**

RAID Controller Considerations

This appendix provides RAID controller information, and it includes the following sections:

How to Determine Which Controller Is in Your Server

This server can be ordered or configured with a number of different RAID controllers:

- RAID 0, 1, 5, 6, 10, 50, and 60 support for up to 12 SAS or SATA drives, with the optional LSI MegaRAID SAS 9260-8i RAID controller

Note You can configure a mixture of SAS and SATA drives when using an LSI MegaRAID card. However, you cannot mix SAS and SATA drives within a volume. Two hot spares are supported so that you can configure a global hot spare for each type (SAS or SATA), and then configure your volumes to use their corresponding hot spare type (SAS or SATA).

There is a dedicated SAS riser slot for the RAID controller card in the chassis. There is also a mounting point inside the chassis for the optional RAID battery backup unit that is available when using the LSI MegaRAID SAS 9260-8i controller.

If you do not have a record of which option is used in your server, you can read the on-screen messages that are displayed during system bootup

Information about the models of card installed are displayed as part of the verbose boot. You are also prompted to press **Ctrl-H** to launch configuration utilities for those cards. For servers running CIMC firmware earlier than release 1.2(1), see also How to Disable Quiet Boot For CIMC Firmware Earlier Than Release 1.2(1), page C-2.

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How to Disable Quiet Boot For CIMC Firmware Earlier Than Release 1.2(1)

For CIMC firmware and BIOS release 1.2(1) and later, Quiet Boot has been removed. If you are running CIMC firmware and BIOS earlier than release 1.2(1), you can use the following procedure to disable Quiet Boot.

To disable quiet boot, so that controller information and the prompts for the option ROM-based LSI utilities are displayed during bootup, follow these steps:

Step 1   Boot the server and watch for the F2 prompt.

Step 2   Press **F2** when prompted to enter the BIOS Setup utility.

Step 3   On the Main page of the BIOS Setup utility, set Quiet Boot to **Disabled**.

This allows non-default messages, prompts, and POST messages to display during bootup instead of the Cisco logo screen.

Step 4   Press **F10** to save your changes, and to exit the utility.

How To Launch an Option ROM-Based Controller Utility

To alter the RAID configurations on your hard drives, you can use your host-based utilities that you install on top of your host OS, or you can use the LSI option ROM-based utilities that are installed on the server.

When you boot the server and you have quiet boot disabled, information about your controller is displayed. The prompts for the key combination to launch the option ROM-based utilities for your controller are also displayed.

To launch an option ROM-based controller utility, follow these steps:

Step 1   Watch for the prompt for your controller during verbose boot:

Step 2   Press **Ctrl** + **H** for the LSI controller utility.

For More Information

The LSI utilities have help documentation for more information about using the utilities.

For basic information on RAID and how to use the LSI utilities, see the documentation at LSI.com:

- LSI MegaRAID SAS Software User's Guide (for LSI MegaRAID)

    http://www.cisco.com/en/US/docs/unified_computing/ucs/3rd-party/lsi/mrsas/userguide/LSI_MR_SAS_SW_UG.pdf

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